IMPERFECT INFORMATION AND HOSPITAL COMPETITION IN DEVELOPING COUNTRIES: A BANGKOK CASE STUDY

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ABSTRACT

In industrialized countries there has been a long debate about the extent of market failure in health care. Recently similar concerns have arisen in developing countries as international organizations have advocated a greater role for the private sector. In many developing countries the private health care sector is already substantial, yet limited information is available about the behaviour of private providers. Empirical evidence is essential to the formulation of policies about and regulation of the private sector. This study explores the nature of hospital competition in Bangkok and in particular the impact which (i) problems of asymmetric information (ii) product differentiation and (iii) consumer behaviour have upon hospital competition.

The nature of hospital competition is analysed directly through examining the impact of market concentration on prices, profitability, intensity and quality of care provided, and indirectly through a consideration of the underlying market conditions and institutions and their impact on competition. Direct evidence is sought through the analysis of a hospital database covering approximately forty hospitals in the Greater Bangkok area. The indirect evidence is based on a survey of consumer knowledge and behaviour in the Bangkok health care market, supported by interviews and document review.

A substantial degree of both horizontal and vertical product differentiation is observed amongst hospitals in Bangkok. Consumers are relatively well-informed about differences between hospitals, willing to seek further information and quite sophisticated in their decision-making, however only limited price sensitivity is apparent. Non-price competition is dominant; hospitals facing higher competition have higher profitability and higher prices. Some evidence of both quality competition and supplier induced demand is found, but the study is inconclusive as to the extent of these.

The findings support concerns in Thailand about the problems associated with a poorly regulated private health care sector and highlight the difficulties in regulating a very complex market such as that for hospital care.

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ABBREVIATIONS

BMA	Bangkok Metropolitan Authority
BOI	Board of Investment
CS	Caesarian Section
CSMBS	Civil Servants' Medical Benefit Scheme
CT	Computerized tomography
ESWL	Electro-shock wave lithotripter
FTE	Full time equivalent
GDP	Gross Domestic Product
GP	General practitioner
HHI	Hirschman-Herfindahl index
ICU	Intensive Care Unit
IP	Inpatient
LOS	Length of stay
MLD	Medical Licence Division
MOPH	Ministry of Public Health
MRI	Magnetic Resonance Imager
NGO	Non-governmental organization
OP	Outpatient
SET	Stock Exchange of Thailand
SSF	Social Security Fund
SSO	Social Security Office
UTH	University Teaching Hospital
WCF	Workmen's Compensation Fund

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A PhD thesis can be remarkably intrusive; a personal burden which may occupy one's thoughts too much of the time. I would like to thank my husband Chris Lane for his good

humour and consistent support which made the burden lighter, and also thanks to my parents for their belief in education and in my own abilities.

'Classical supply and demand analysis may help us to understand the social institutions of very simple and primitive medical economies. But it is singularly unhelpful when applied to the immensely complicated play of forces operating in the field of modern scientific medicine. Theoretical short-cuts are no substitute for the slow and painful study of reality.'

Titmuss 1963

CHAPTER 1
INTRODUCTION

1.0 WHY EXAMINE HEALTH CARE MARKETS?

The seeds of this thesis were sown during an investigation into the relative efficiency of public and private sector health care providers with a particular focus on developing countries. Despite the dearth of sound empirical studies from developing countries on this topic, the overwhelming impression was that there was no regular and predictable difference in efficiency between the two sectors. For example, in the US there are studies demonstrating that the unit cost at for-profit hospitals is higher than that at non-profit ones (Gaumer 1986), that the reverse is true (Bays 1979), and that there is no significant difference (Register et al 1985). There are undoubtedly difficulties in comparing efficiency in the health care sector, the most obvious being the need to capture subtle variations in case-mix, severity and quality of care, but the apparently contradictory results described above are not necessarily due to flawed studies. Although textbook economics would suggest that for-profit organizations are likely to operate more efficiently than other organizations due to their profit motive, this result is dependent upon a standard and smoothly functioning market place. If the market does not operate in a standard manner, for example prices are paid by a third party insurer and often constitute a simple mark-up on production costs, then the rational profit maximizer may not minimize costs. This was indeed the explanation used by Gaumer (op cit) to explain his study findings. The behaviour of health care providers is so dependent upon market and regulatory structures that any attempt to analyse the behaviour of providers without reference to their environment is bound to fail. This is of course true of other goods as well, but the complexity and diversity of health care markets makes the maxim even more important.

During the past decade a reappraisal of the appropriate role of the state has taken place, across a wide range of sectors and countries. Our original investigation of the comparative efficiency of public and private health care providers had been stimulated by a policy shift during the mid to late nineteen-eighties in international organizations such as the World Bank and bilateral donors such as USAID. These organizations had advocated an increased role for the private sector in health care (World Bank 1987, World Bank 1993). The new policy line emerging was not

obviously the product of a considered and rational examination of developing country problems. There was clearly a strong ideological component to the proposed reforms, however the most commonly stated rationale for the new set of policies was that the increased use of market mechanisms in health care would improve efficiency. It was suggested that private organizations were generally more efficient than public ones (World Bank 1987). An important role for government in the provision of certain preventive and public health services such as immunization, water supply and treatment of tuberculosis was acknowledged as the existence of both externalities and merit good characteristics in such services would lead to their under-provision if left to the private sector. But curative health care services, it was argued, are much like any other good and as such should be financed and provided privately (Birdsall 1989, Griffin 1989).

In developing countries themselves there is often widespread acknowledgement of inefficiencies within the public health care system (Mills 1995). However probably the principal appeal of privatization policies to developing country policy makers is that they will relieve the pressure on already overstretched and often under-funded Ministry of Health budgets.

There is only limited empirical evidence to support the claims being made about private health care providers in developing countries, indeed until recently very little research on the private health care sector had been undertaken. A handful of research studies have investigated the size and growth of the sector (eg. Bhat 1991, McIntyre and Valentine 1995, Parker 1980), the characteristics of users of private providers (Mulou et al 1991), the relative efficiency of public and private sector providers (Alailima and Mohideen 1984) and the quality of care offered by private providers (Aljunid 1995, Uplekar 1989a and b). Household surveys have commonly been used to estimate the demand for health care services including that for private sector care (Akin et al 1986, Heller 1982). There has been virtually no work on the nature of the health care market environment in developing countries and how this interacts with provider behaviour.

Furthermore appropriate conceptual and methodological tools for examining health care markets have hardly been developed. In industrial economics the traditional starting point for investigating markets is an analysis of market structure and how market structure affects the behaviour and profitability of firms (Shy 1995, Waterson 1984). In health care even the definition of a market

is not straightforward; is it appropriate to speak of a market for inpatient services, or a market for surgical services, or a market for appendectomies? Measures of market concentration will vary according to whether a narrow specialty service or a broader grouping of services is considered (Robinson et al 1991). The geographical definition of market areas is also unclear; a market may be defined in terms of actual patterns of utilization or some notional measure of accessibility such as distance to the hospital. This too will affect measures of concentration.

Health care systems in most Western European countries are financed from the public purse or through compulsory health insurance schemes. Thus although provision of care may be shared between the public and private sector (as is the case in France and Germany for example), the emphasis until recently has been on collaboration and coordination rather than creating the competitive pressures of the market place. Even recent health care reforms within Europe still carefully circumscribe the role of market mechanisms (Culyer et al 1990, Saltman and von Otter 1992). Consequently in Europe there has been only limited development of the necessary conceptual and methodological tools to analyse the functioning of health care markets. Compared to Europe the US health care sector is certainly less dominated by government finance and has a considerably larger role for private providers. Correspondingly there is a much larger body of research work analysing competition in health care markets. However it would be incorrect to portray the American health care market as a free, unregulated one; government intervenes considerably in the market through, for example, certificate of need legislation, licensing laws, anti-trust regulation and perhaps most significantly, the purchase of care for approximately 72 million people through the Medicare and Medicaid Schemes (Joskow 1980, Havighurst 1986, Newsweek 1995).

Analysis of health care markets in developing countries is further complicated by poor data quality and availability. Research studies in the US have commonly drawn upon substantial existing databases and it would not be feasible to replicate the methods used in such studies in the developing world, where data is both of poor quality and in short supply. Most developing country governments have readily available only the most basic data on private sector health care providers, such as location and bed numbers, and often this is out of date or unreliable (WHO 1991). Furthermore private providers are often extremely reluctant to collaborate with researchers or allow access to their records.

One of the most important benefits which has come from the recent international focus upon the private health care sector is an acknowledgement of the significance of the existing private sector in developing countries. Until the late eighties much of government policy seemed not to consider the role of the private sector. For example the policies endorsed by ministers of health in the 1978 Alma Ata declaration effectively ignored the private sector; Health for All by the year 2000 was to be achieved primarily by reorienting government resources (WHO 1978). Yet in many lower and middle income countries the private health care sector is substantial. In India for example it is estimated that more than three-quarters of health care contacts are in the private sector (Bhat 1991). On the continent of Asia (excluding India and China) approximately 60% of total health expenditure is private, in Sub-Saharan Africa the corresponding figure is 44% and in Latin America and the Carribbean 40% (World Bank 1993). In rural areas private providers of modern medicine are often few and far between, but in urban areas they are commonly plentiful and their numbers recently have increased rapidly, particularly in countries where there is an over-supply of doctors (Bhat 1991, Garner and Thaver 1993). In cities such as Bangkok, Bombay and Jakarta large numbers of private providers, both at the primary and hospital levels, compete amongst themselves and (possibly) with the public sector.

This thesis attempts to shed light on how markets such as these operate. In particular our focus is on the extent and form of competition prevailing in such markets and how two key variables, the degree of imperfect information on the part of the purchaser of health care, and variations between providers in the quality and nature of care delivered, affect competition.

It is intended that the results emerging from this study contribute to the ongoing debate about the appropriate role of government in health care in developing countries. However there are less grand but equally critical policy concerns to be addressed by the research. Given the large scale of the private health care sector in many developing countries, few governments would find it either feasible or desirable to nationalize it in the foreseeable future. Wide scale privatization of government services is just as unlikely. In the mixed economy of developing country health care, research is required to establish which measures governments can adopt to ensure that resources for health (both public and private) are used as efficiently as possible. For example, it may be useful to know the basis on which prospective patients choose a health care provider and how sensitive they are to factors such as quality and price. If people act in a consumerist manner and

seek information to guide their decision then, through the dissemination of appropriate information, government may reduce search costs and enable the market for health care to function more smoothly. Similarly a greater understanding of how health care providers compete would allow governments to focus their regulatory efforts upon areas where competition may lead to inappropriate standards, whether this be levels of high-technology equipment or heavy reliance upon nurse aids.

It has already been indicated that the broad topic of this thesis has been the subject of considerable debate and discussion in both national and international arena. In order to place the subsequent chapters in proper historical context the following section briefly outlines the development of the public/private mix debate and the form which it has taken in developing countries.

1.1 THE PUBLIC/PRIVATE MIX DEBATE

The debate about the appropriate roles of public and private sectors in health care has been polarized with participants forcefully expounding the virtues of the private sector and the great shortcomings of the public sector, or vice versa. In many European countries, particularly those of northern Europe, there emerged in the post-war period a consensus that access to health care should be determined by need rather than ability to pay (Abel-Smith 1990, Saltman and Von Otter 1992). In response to this, many European societies attempted to improve access and coverage by expanding the role of the public sector in health care through the establishment or expansion of a national health service or national health insurance schemes. However debate about the role of government re-emerged during the 1960s, with critics of socialized medicine arguing that health care was much like any other good and therefore could be provided through the market (eg. Lees 1961, Friedman 1962). Anti-marketeers responded that health care was so different from other consumer goods that market provision was inappropriate (eg. Titmuss 1963, Arrow 1963).

As many developing countries became independent during the 1960s and 1970s they commonly adopted at independence the type of health care system prevailing in the countries of their former colonial rulers. In much of Anglophone Sub-Saharan Africa government financed and provided health care systems were established whilst Francophone countries attempted to expand the

coverage of compulsory health insurance schemes (Bennett and Ngalande-Banda 1994). The right to free health care for all was often established as a basic tenet of the new government (Zwi and Mills 1995). Many populist socialist states, such as Zambia and Tanzania, passed regulations curbing the role of the private sector (Kalumba and Freund 1989, WHO 1991) and in Marxist-Leninist states such as Mozambique the whole health sector was nationalized (Walt 1983). In South and South-east Asia the private sector was more likely to remain unchecked, but there were strong efforts to provide publicly funded health care, and occasionally the role of the private sector was limited as in some socialist states in India (Jesani and Anantharam 1989). Broadly speaking, during the post-colonial period, the public sector in developing countries became viewed as the primary player in health care.

In the industrialized west, disillusionment with the supremacy of statist ideas became more acute during the mid-seventies with the onset of recession. The long-standing liberal tradition dating back to Adam Smith, was resurrected and promoted with new vigour. The New Right attributed many of the economic and social problems in industrialized countries to an excessively dominant role for the state vis a vis the individual. A free market, it was argued, would both create more appropriate incentives for an efficient economy and was an absolute good in its own right, as it protected individual liberty (Nozick 1974). During the 1980s and 1990s these arguments were followed through in policy implementation initially through the privatization of nationalized industries, but increasingly in less obvious sectors such as health care (Peele 1989).

Recent policy reforms in the Germany, Holland, Sweden and the UK have all introduced a greater element of the market into the formerly state dominated health service (Culyer et al 1990, OECD 1992, Saltman and von Otter 1992, Saltman 1995). None of the industrialized countries have deserted the principle of state finance, but all of the countries mentioned above have attempted to introduce an element of competition in the provision of care in order to improve efficiency. This has been attempted by developing or strengthening the role of purchasing agencies (as in the Germany, Holland and the UK) or alternatively by making funds follow patients (as in Sweden).

Since the rise of the New Right in the US and the UK during the late 1970s and early 1980s developing countries have come under increased external pressure to reform their pro-statist

policies through privatization of state owned enterprises and economic liberalization (Adam et al 1992). More recently external pressure has often taken the form of aid conditionality (Mosley 1988). External pressure has commonly been complemented by a realisation that the state-led import substituting policies of the Independence period have failed to deliver the anticipated economic development and have sometimes led to bloated and corrupt bureaucracies (World Bank 1981, Dia 1992). New models of development were required. Shrinking budgetary resources, due to the decline in commodity prices and subsequent recession in many developing country economies, put further pressure upon governments to reconsider how public monies are spent; whether more services could be privately funded and provided, and whether public services could be delivered more efficiently.

The broad global trend towards privatization was finally reflected in developing country health sectors around the mid-eighties. One of the clearest articulations of the policy is contained in the World Bank's document 'Health Sector Financing: An Agenda for Reform' (1987). In this paper four main policies (user fees, insurance, privatization and decentralization) were promoted as ways of improving efficiency and equity in health care, as well as increasing the level of resources available to the health care sector. The ideas contained in this document have been intensely debated since and have been extremely influential. In terms of privatization it has become clear how little empirical data there are upon which to base policy decisions (Cross and Levine 1991, WHO 1991). Moreover the policies adopted by the World Bank seemed to be increasingly out-of-touch with accumulated wisdom in both the US and Europe.

The debate which followed the publication of 'An Agenda for Reform' succeeded in refining, and in some respects moderating, the original policy line. Increasingly a consensus is emerging which recognizes the importance of government finance for at least highly cost-effective services, particularly those with a high degree of externalities or with a public good nature. However statements emanating from the World Bank and USAID still suppose a substantial number of benefits associated with an increased role for the private health care sector in developing countries. For example the 1993 World Development Report on health envisaged a substantial role for the private health care market. It recommended that government focus upon the provision of

a 'basic package' of essential health services[1], whilst all other services be left to the private sector. Current controversy in the developing world bears considerable resemblance to the debates of the 1960s (and beyond) in the industrialized world; how different is curative personal health care from other goods and how serious are the implications of these differences for the functioning of health care markets? To some degree the answers to these questions are culturally and contextually specific and thus need to be found through empirical investigation.

1.2 PURPOSE, SCOPE, APPROACH AND CONTENTS

1.2.1 Purpose

The purpose of the thesis is partly to contribute to the ongoing debate about the appropriate role of markets in health care, but less ambitiously, also to make concrete recommendations about the scope for government (or other agents) to improve the functioning of health care markets.

For further development in the analysis of health care markets in developing countries, better methods are required, both at the conceptual level and in terms of data collection and processing. A further purpose of the thesis is to construct and test a conceptual framework and to help develop tools for health care market analysis in developing countries.

1.2.2 Scope

Bangkok, Thailand was selected as the focus of this research. This was for two main reasons. Firstly Thailand, and Bangkok in particular, has an extensive private health care sector and the Thai government is now facing problems of rapid private sector growth, cost containment and inappropriate use of technologies making the concerns of this study very policy relevant (Nittayaramphong and Tangcharoensathien 1994). Moreover the problems posed by private health care in Bangkok are not peculiar to Thailand, many other cities in the region, such as Jakarta, Bombay, Manila, Kuala Lumpur and increasingly the cities of Southern China face a similar situation (Yesudian 1994, Yuen 1992). Secondly a close collaborative relationship exists between the Health Policy Unit, London School of Hygiene and Tropical Medicine and the Ministry of Public Health, Thailand which meant that the research could potentially shape policy in what is

[1]In low income countries the basic package at 'a minimum' would offer family planning, basic maternity and child health services, tuberculosis and STD control (World Bank 1993).

a rather sensitive policy area[2]. Moreover working with the Ministry of Health the researcher was able to access records not in the public domain, and was given a high degree of logistical support.

The size and scope of the health care market in Bangkok makes it essential to restrict the study to just one aspect of the health care market: the study focuses upon the market for hospital services. Although it is common for hospital contacts to account for only a small proportion of provider-patient contacts, this is not necessarily the case in Bangkok. The importance of hospital contacts is considerably greater in Thailand than in the West. In Thailand patients are able to access directly without referral, any level of hospital they wish for ambulatory or inpatient care. The situation is similar throughout much of South-east and East Asia. For example in Taiwan it was noted that:

> 'Providers in clinics seldom offer any suggestion for further higher level treatment for patients. Patients usually consult friends for a higher level provider or just 'shop around'. Even if the illness is a minor one which could be treated in a cheaper clinic, patients like to go to hospital for treatment.' (Su 1995)

Moreover the hospital level forms an important focus for research as the cost of the care is high (Barnum and Kutzin 1993) and in Thailand there has been recent rapid growth in the private hospital sector making it the focus of concern for policy makers. Finally the availability and quality of routine data on private hospitals tends to be considerably better than for the private primary care sector.

1.2.3 Approach

In the tradition of economic theory the general approach adopted is to consider if and how markets for hospital care in developing countries differ from standard models of perfectly competitive markets and hence the implications for the behaviour and performance of hospital firms. Although little has been written about hospital markets in developing countries, there is a substantial literature in economic theory and health economics in the US about how markets which are pervaded by asymmetric information and product diversity function. These theories are used as the basis from which to develop a developing country specific model. However in order

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2 At the time of the study the author was a staff member at the Health Policy Unit.

to adapt industrialized country models for use in developing countries a review of the specific institutional forms of health care markets in developing countries and the role of consumers in these markets is made.

Although there is no shortage of theoretical models to draw on, gathering good empirical data is a major problem. Private hospitals in Bangkok are extremely reluctant to allow access to researchers, even for relatively unobtrusive data collection, such as interviewing outpatients on the private hospital site. This problem has shaped the study to a considerable degree; the approach has avoided collecting any data from hospitals which would be perceived as sensitive in nature and has instead depended mainly upon compiling data from existing administrative records and investigating the demand side of the market.

1.2.4 Contents

Chapter 2 reviews the literature from industrialized countries on how markets for health care may operate. It is argued that imperfect knowledge on behalf of the consumer, product diversity and a reluctance of patients to act in a consumerist manner are the key features in industrialized country health care markets.

In Chapter 3 the evidence concerning the nature of health care markets in developing countries, and in particular Bangkok, is reviewed. Chapter 4 aims to synthesize the theoretical discussion of Chapter 2 and the empirical evidence of Chapter 3 so as to develop a conceptual model of health care competition in developing countries.

In Chapter 5 the methods used in the study are outlined. Two discrete but interrelated approaches are described. In the first, a market wide approach is used to examine the characteristics and behaviour of hospital firms. The results of this component are presented in Chapter 6. The second component considers the role of consumers in the market and in particular focuses on questions concerning the extent of consumer knowledge and types of consumer behaviour. The results of this component of the study are presented in Chapter 7. In Chapter 8 evidence relating to the form of hospital competition in Bangkok is analysed.

Chapter 9 discusses the findings from the three previous chapters in more depth and the final

chapter considers the policy implications of the study both for Thailand and developing countries more generally.

CHAPTER 2

APPROACHES TO IMPERFECT INFORMATION AND PRODUCT DIFFERENTIATION IN HEALTH: AN INDUSTRIALIZED WORLD PERSPECTIVE

2.0 INTRODUCTION

Although analysis of developing country health care markets has been limited, there is no shortage of literature which may contribute to a conceptual analysis of such markets. The two most obvious bodies of work are (i) economic theory and (ii) studies of health care markets in the industrialized world, and particularly in the US.

The usual starting point for any analysis of competition in markets is industrial economics. However as section 2.1 demonstrates there are reasons why standard models of industrial organization and competition may not offer satisfactory explanations of health care markets. In Chapter 1 it was argued that one of the key characteristics of health care markets is the acute asymmetry of information between the patient and the health care provider. There is now a substantial literature in economic theory addressing how markets operate when asymmetric information is present and section 2.2 attempts to give a flavour of the relevant material. Integral to the problem of asymmetric information is that of product diversity; the more complex and differentiated health care services become, the greater the problems of asymmetric information are likely to be. The discussion of product differentiation in section 2.3 suggests that product diversity on its own may create market power, but when combined with imperfect information, market failure is even more acute.

There have now been numerous empirical studies examining the degree to which various types of health care markets in the US conform to the standard model of price competition. Three main alternative models of health sector competition exist which, to varying degrees, draw upon the economic literature on asymmetric information and the application of this to industry. These models and approaches to their empirical testing are explored in section 2.4 and 2.5.

Finally in recent years a number of empirical studies in the health sector have turned the focus away from market level analysis to individual actors. Standard economic theory assumes consumers to be both sovereign and substantively rational. That is consumers know what is

in their own interest better than anyone else, and are able to decide, given the prevailing conditions and constraints, how best to achieve their own interests. In health care, asymmetric information is problematic to this assumption, but there is an even more fundamental issue regarding whether patients wish to act like consumers at all. It has frequently been asserted that the principle of consumer sovereignty is inappropriate in the health sector context; patients wish to place their trust in health care providers and thus the exchange is unlike regular market transactions (Press 1978). Such studies and their implications are discussed in section 2.6.

This chapter does not seek to provide a definitive blueprint of how health care markets are likely to operate. Such a blueprint is unlikely to exist; market functioning will vary according to differing institutional arrangements, cultural differences and even the service under consideration. Instead the aim of the chapter is to identify the key dimensions which need to be considered when analysing health care markets and to provide possible alternative models for their operation. The final section draws out the implications for hospital competition in developing countries from the preceding discussion.

2.1 STANDARD ECONOMIC THEORY AND COMPETITION

Standard models of competition envisage a chain linking the structure of an industry (particularly market concentration) to the conduct of firms within that industry and hence to performance[1] (Bain 1968, Waterson 1984). Associated with different market structures are different forms of competition. At one extreme there is the perfectly competitive market, where there are many buyers and sellers,and firms do not have any market power but are forced to accept the competitive market price for their product,leaving them only with a decision about the optimal quantity to produce. In such an environment they will make 'normal'[2] profits. This model of perfect competition is essentially one of price competition, it suggests that firms will not be able to raise their price (even minutely) above the competitive price without losing all customers. At the opposite pole a monopolist is the single seller in an industry who faces a fixed downward sloping aggregate demand curve. Faced with this demand curve the monopolist will choose to produce at a profit-maximising price and quantity.

[1] This is commonly known as the structure-conduct-performance paradigm.

[2] Firms in perfectly competitive markets are also sometimes said to make zero profits, however measured in the standard accounting form profits will not be zero as there is an expected return to the entrepreneur who has taken the risk.

Between these two extremes are a range of other market forms where firms have some degree of market power. The form of competition in such markets is not as fixed as for the two extreme market structures but depends on a range of differing assumptions about firm and consumer behaviour. A distinction is commonly made between oligopoly and monopolistic competition; although both are forms of imperfect competition, in oligopoly a relatively small number of firms are interdependent. Thus in developing its own market strategy each firm must conjecture about the behaviour of other firms. In the case of monopolistic competition there are many sellers and buyers and thus this interdependence between firms does not exist, however for reasons to be discussed in section 2.3 each of these sellers has some degree of market power.

The strict conditions for perfect competition appear elusive in the real world, nonetheless analysis based on perfect competition is widespread and often successful. It has been argued that the perfectly competitive model is a useful abstraction from reality and the results of the model are sufficiently robust for it to have wide reaching applications (Friedman 1953). In explaining health care markets, perfect competition must clearly not be ruled out. The structure-conduct-performance paradigm has also criticized; it is a rather deterministic approach which makes scant recognition of the strategic behaviour for firms which may influence market structure (Waterson 1984). Commonly observed behaviour such as advertising, research and development, explicitly attempt to change the market environment within which a firm operates. Advances in game theory in the 1970s enabled economic theorists to develop more sophisticated approaches whereby behaviour of the firm with respect to pricing, R and D etc influence the form of the final equilibrium, and crucially, such models were able to incorporate better, strategic behaviour in the face of asymmetric information..

The model of perfect competition has also been criticised for being founded in price competition, yet remaining silent on the issue of how prices are actually set (Roberts 1990). This point highlights the fact that standard models of competition are concerned solely with how firms respond to outward stimuli and do not analyse how internal organization affects this response. Particularly when owners are separate from managers, decisions may be the result of a quite complex set of interactions (Cyert and March 1963). This would appear to be a particularly relevant insight in the case of hospitals where owners, managers, physicians and nurses may all shape the objectives and behaviour of the firm (McGuire 1985). The profit-maximising motive of firms has also been commonly questioned and more complex objective functions suggested (Baumol 1971).

2.2 ECONOMIC MODELS OF ASYMMETRIC INFORMATION

Debate about the appropriateness of health care markets has centred around problems which arise when a seller knows more than the purchaser. This asymmetry of information has two main implications for the market. Firstly if patients tend to be less informed than providers then they may find it difficult to judge the quality of care offered and hence whether it is offered at a fair price. This type of informational asymmetry is similar to the problem analysed by Akerlof (1970) in his seminal article 'The Market for Lemons'. Secondly, for certain conditions, patients attending a physician may lack information about both the nature of their ailment and the most appropriate form of treatment to take. Thus they may have to delegate the decision about what course of treatment to take to the physician. Principal-agent theory in economic theory is concerned with just such situations.

Akerlof (1970) considered the implications for a market of consumers being imperfectly informed about product quality. It was suggested that all goods would change hands at the price associated with average quality. Higher quality sellers would therefore exit from the market thus reducing average quality and price. This process would be iterated until the market had disintegrated. However in reality, the complete breakdown of markets with asymmetric information is prevented through a variety of mechanisms, two of the most important and relevant of which are signalling and minimum quality standards.

High quality sellers will attempt to signal to potential purchasers the quality of their product so that they are able to charge more than the average price. Naturally there is an incentive for lower quality sellers to try to imitate such a signal, hence it is suggested that the signals emitted will only be credible if they are associated with an activity which is lower cost for higher quality sellers to undertake (Spence 1973). The classic example of signalling occurs in labour markets where higher quality potential employees may attempt to distinguish themselves from other sellers of labour by gaining qualifications. The cost to more able persons of gaining qualifications is modeled to be less than the cost to the less able. The concept has also been applied to insurance where low risk individuals signal their lower degree of risk by selecting insurance packages with less complete coverage (Rothschild and Stiglitz 1976). Although signalling may prevent complete market failure it is not necessarily costless. Spence (1976) distinguishes between 'contingent contracts' and 'exogenously costly signals'. The example of the selection of an insurance package is a good example of a contingent contract; the signal efficiently conveys information and there is no welfare loss. On the other hand an exogenously costly signal has a social cost associated with the signalling

action. Education purely to gain qualifications so as to signal the quality of the individual (in contrast to education to enhance productivity) is a good example of this.

Price can be used as a signal of product quality. This may occur if consumers can gain, either through direct observation or previous purchase, some indication of quality. At a certain price consumers expect to find a certain quality, if a firm chooses to provide less quality than expected at a certain price then they may lose customers. At equilibrium all price signals are such that each firm's profit maximizing quality is that signalled by its price (Wolinsky 1986). Furthermore the mark-up over marginal cost will vary directly with the degree of imperfect information amongst consumers.

Another mechanism through which the problems of asymmetric information between seller and buyer about quality may be alleviated, is minimum quality standards. Leland (1979) shows formally that under certain conditions such minimum quality standards will resolve problems of asymmetric information, although they may lead to other problems such as monopoly side effects for the sellers.

Whilst health care providers may engage in signalling activity, patients may undertake consumer search, seeking out information about the price and quality of different goods on the market. The basic search rule suggests that consumers will carry out search activities up to the point where the expected marginal benefit of the search is equal to the marginal cost of carrying out the search (Stigler 1961). The way in which search activity is modelled varies: consumers may visit a number of retailers sequentially seeking the lowest price, or ask friends randomly, or purchase a guide to prices. The appropriate way in which to model search behaviour depends partly on the nature of the good/service under consideration. For example, for some goods the potential purchaser may be able to make a reasonable assessment of quality prior to purchase, these are known as search goods. For others, such as second hand cars the good must be purchased before the quality can be properly appraised, these are known as experience goods (Nelson 1970). Sometimes consumers may pass by word of mouth information about a good, thus the quality or price of a good in one period may affect consumption patterns in the next. Such goods are often called reputation goods. The search literature covers both asymmetric information about quality and about price.

The centrality of the agency relationship between health care providers and patient in health economics has been widely recognized and will not be discussed at length here. Principal-

agent theory has been applied to a variety of economic activities; essentially any where an agent acts on behalf of a principal, including employees in a firm, managers acting on behalf of shareholders, and sharecropping arrangements. The fundamental problem in the principal agent literature is how the principal can design a contract which will motivate the agent to act in the principal's best interest given differing utility functions of principal and agent and differing information sets (Stiglitz 1990). A number of factors will affect the design of the contract and the success of the relationship, including the form of the two utility functions, the amount and type of information the principal possesses about the agent's actions, the period over which the relationship will be maintained for, the punishments available for breaking the contract and the ease with which violations of the contract can be verified.

In health care it is often assumed that the utility functions of principal and agent are rather closer than the standard economic literature implies (McGuire et al 1988) and that due to strong professional ethics the health care provider will act in the best interests of the patient. However it is clear that this is contingent upon a number of conditions. Standard principal-agent theory sheds light on these conditions. The form of the contract, or payment mechanism, is important. Fee-for-service payment often being said to create greater incentives for over-servicing. Health care systems where patients tend to stick with one regular health care provider, rather than switching providers may also encourage more appropriate behaviour. The available sanctions for misbehaviour would also appear to be important.

Although the principal-agent literature focuses upon a single relationship, in health care there are generally multiple interacting relationships at play which need to be taken into account. The physician may be the patient's agent but frequently is also an agent for the government or a health insurance organization, at least in the sense of providing services which a third party payer funds. Moreover in a hospital setting doctors are agents of managers and managers in turn may be agents of shareholders. The way in which doctors (and managers) are paid will thus also affect how good an agent the physician is for the patient.

2.3 ECONOMIC MODELS OF PRODUCT DIFFERENTIATION

2.3.1 Theoretical models

In health care markets throughout the world substantial diversity is observed in the health care services offered. Not only is there a range of different types of providers (hospitals, small clinics, traditional healers, physiotherapists etc), but even within a certain type of provider group the quality and type of care offered may vary enormously. Product differentiation may

segment the market, limiting the degree of competition prevailing. In addition product diversity is a core part of asymmetric information problems.

Two types of product differentiation (horizontal and vertical) are often distinguished. In horizontal product differentiation the differences between products or services are rooted in consumers' fundamental differences in taste. The simplest examples of horizontal product differentiation are where there is only one characteristic under consideration, such as the sweetness of a dessert. Some individuals may prefer extremely sweet desserts where others prefer them to be less sweet. In contrast vertical product differentiation occurs when the goods on the market have the same set of (desirable) characteristics but some simply have more of the characteristics than others. Consumers would unanimously agree on a preference ranking of the products, but as they have differing preferences over income and intensity of feeling for the product they will consume products of different quality (Waterson 1989).

The simplest approach to horizontal product differentiation is based upon the spatial model of competition developed by Hotelling. It considers a good with just one characteristic, such as the sweetness of a dessert. Consumers tastes are spread evenly over the whole range of degrees of sweetness (see figure 2.1) and firms may produce at any point along the space. Paralleling the spatial model it is assumed that consumers face an additional cost (x) in consuming a product which does not exactly match their own tastes, (x) is related to the distance between their own personal taste for sweetness and the sweetness of the product which they consume. Thus if three firms were producing desserts at points A, B and C on the sweetness scale and charging the same price (p), then a consumer at point (Y) would choose to consume B as the price to the consumer ($p+xd_1$) is less than that of product A ($p+xd_2$) and product C. Sunk costs in production would imply that firms are not able to move easily along the scale. This may be a reasonable assumption for certain types of health care, particularly the more capital intensive forms. Under these circumstances firms will locate evenly across the scale so as to share out the market between them (Eaton and Lipsey 1978). If a new firm wishes to enter the market then it is forced to locate between two established firms (say at D). It is possible that at such a point it will be unable to capture sufficient of the market to break even. Sunk costs act as a barrier to entry and firms in the market may make positive profits.

The Hotelling type model only deals with one (or two polar) characteristics, but goods frequently have more characteristics. Lancaster (1966 and 1971) argued that traditional demand theory failed to capture any of the important information about the nature of the good

Figure 2.1
Product differentiation using the spatial competition model

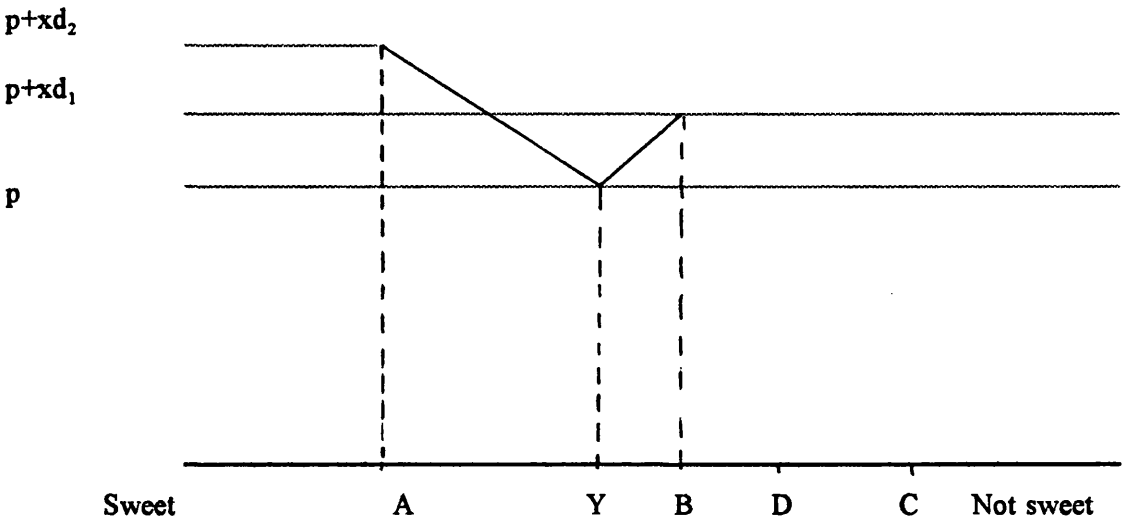
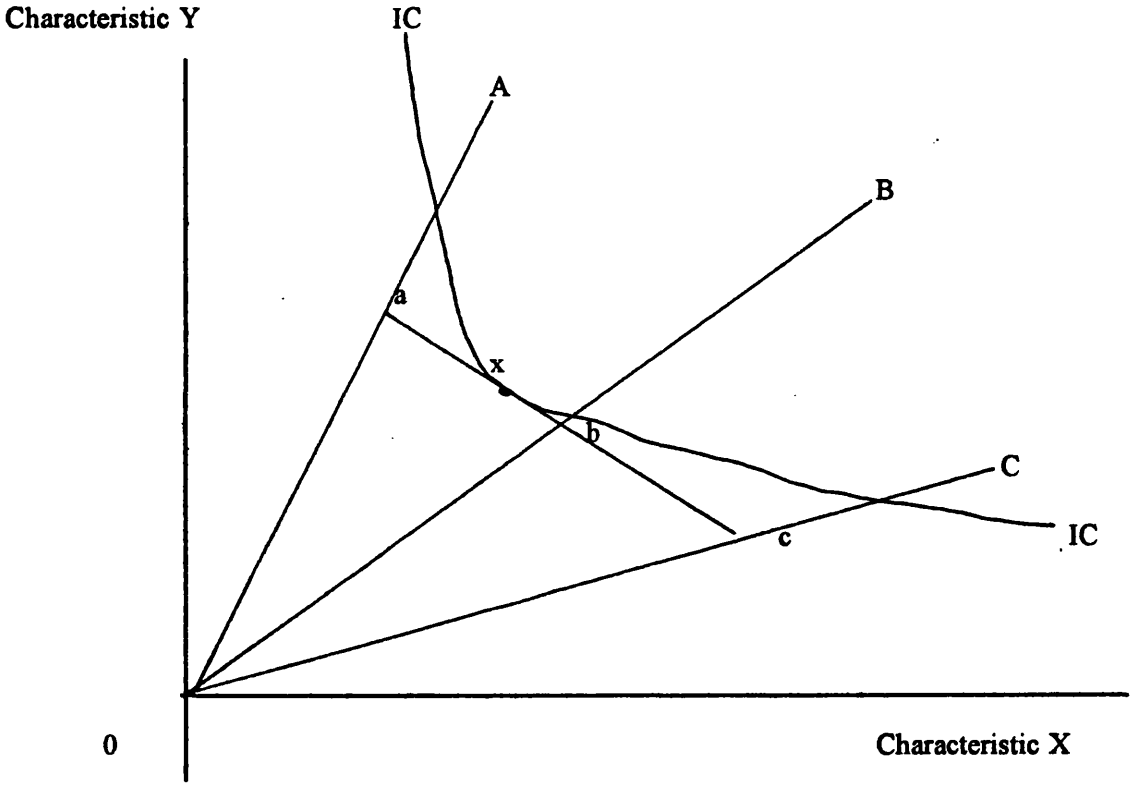


Figure 2.2
Product differentiation using Lancaster's characteristics model



in demand thus economic theory had difficulty in analysing phenomenon such as product innovation and product diversification. In the characteristics approach which he developed, consumption is seen as a technology; a certain good or service is valued by the consumer for the inherent characteristics in it. Consumption of the good allows the consumer to process the characteristics and thus enhance his or her utility. The consumer attempts to maximize utility over the characteristics space, subject to the budget constraint. According to the consumption technology there are two possible ways of doing this. If it is possible to mix goods, as it is with breakfast cereals for example, then consumers will purchase the two goods which are closest to their own preferences and mix them. This is illustrated for two characteristics in fig 2.2. Each of the rays (A-C) represent a good with a different combination of characteristics X and Y[3]. Given the consumer's budget constraint s/he can purchase Oa of A, Ob of B etc. If, on the other hand there are indivisibilities, consumers will select the good which most closely matches their own preferences. In this circumstance small changes in price or specifications of the goods may lead consumers to switch goods.

Sen in his writings on nutrition and welfare has used the characteristics approach, suggesting:

> "There is the notion of a **good** (in this case rice); that of the **characteristic** of a good (eg giving calories and nutrition); that of a **functioning** of a person (in this case living without calorie deficiency); that of **utility** (in this case, the pleasure or desire-fulfilment from the functioning in question, or from some other functioning related to the characteristics of rice)." (Sen 1984)

The technology of health care consumption can be broken into a similar process. The consumption of the different characteristics of health care impact upon the functioning or capabilities of a person, which we perceive to be the absence of disease or injury or impaired capacity. Finally this capability endows the individual with utility, or the well being derived from the individual's health.

Different characteristics of health care can be distinguished such as the clinical curative aspects of health care, information provision and reassurance, caring and comfort. For outpatient services consumers may consume a mix of services so as to maximize their utility. For example Kleinman (1980) in Taiwan commonly observed patients seeking care from both allopathic and traditional Chinese doctors for the same condition. For inpatient care however

[3] Potentially a large number of characteristics could be considered in an analysis such as this, figure 6.2 is constrained by the two-dimensional nature of the page.

it would seem less likely that patients can mix services.

In the health care sector it is likely that elements of horizontal and vertical product differentiation occur together. For example there may be vertical product differentiation within the private hospital care sector; some private hospitals may offer higher quality clinical care, more comfortable surroundings and better nursing care than other private hospitals. But it is commonly suggested that public hospitals offer a different mix of characteristics to private ones; public hospitals may offer higher standards of curative care but lower standards of comfort. Ireland (1987) attempts to combine models of vertical and horizontal product differentiation. The key to the model is whether horizontal product differentiation or vertical product differentiation is dominant. If vertical product differentiation is dominant then everyone will select the inherently higher quality good even if the bundle of characteristics in the good does not closely match everyone's preferences. Conversely if horizontal product differentiation is dominant then everyone will select the good which best matches their preferences despite the fact that it may be of an inherently lower quality. In general horizontal dominance is likely to lead to lower levels of competition and higher revenues than vertical dominance.

In both horizontally and vertically differentiated markets, if there are sunk costs associated with the production of a good or service of a certain mix of characteristics or standard of quality, then entry barriers arise and firms may segment the market and maintain a certain degree of market power. This scenario is essentially that of oligopolistic competition. As the number of firms becomes larger and there are closer substitutes for each good then the market begins to approximate perfect competition. Wolinsky (1986) demonstrates how if product differentiation is combined with imperfect information on the part of the consumer then a monopolistically competitive situation will arise. In Wolinsky's model consumers face positive search costs. As the number of firms in the market becomes larger then almost perfect substitutes become available, however it is sub-optimal for the consumer to examine too many of the available substitutes and hence each firm retains a degree of market power. The smaller the search costs, the better informed consumers will be and the more closely the model approximates perfect competition.

2.3.2 Empirical Applications

Empirical work on product differentiation and the characteristics approach has not kept pace with theoretical developments (Ireland 1987, Waterson 1989). Rosen attempted to

operationalize Lancaster's idea by introducing the notion of an hedonic price function (Rosen 1974). In Lancaster's model consumers place valuations on characteristics rather than goods. Thus by regressing the market price of a good on the characteristics of a good it is possible to identify 'shadow prices' for the individual characteristics embedded in a good.

In practice at least two key questions arise; firstly what are the relevant characteristics and secondly what is the form of the relationship between prices and characteristics (Griliches 1971)? The set of relevant characteristics embedded in certain goods may be unproblematic, for example, the relevant characteristics for a car may be power, fuel consumption, size, comfort reliability etc. But for more complex goods and services, such as health care, the relevant set of characteristics is less obvious. A semi-logarithmic form is commonly used for the hedonic regression equations, but there is no clear theoretical basis for any particular form. Furthermore potential multicollinearity between independent variables means that the shadow prices derived may be imprecise and unstable. Nonetheless the hedonic price approach has been widely used in (i) the estimation of shadow environmental prices through the use of house prices (ii) adjustment of price indices to take account of change in quality of products over time and (iii) estimation of quality adjusted prices in order to investigate company performance.

Hedonic price analyses have been particularly widely used for durable goods such as cars (eg. Cowling and Cubbing 1971), but they have been less commonly applied to non-durables. Thompson (1988) attributes this to the more limited information which tends to be available about the characteristics of non-durable goods. However recent applications of the tool have considered newspapers (Thompson 1988) and breakfast cereals (Stanley and Tschirhart 1991).

In the health sector there would appear to be further problems in applying hedonic price theory. Lancaster states that in order for the theory to be applicable:-

> 'the characteristics possessed by a good or a combination of goods are the same for all consumers and, given units of measurement, are in the same quantities, so that the personal element in consumer choice arises in the choice between collections of characteristics only, not in the allocation of characteristics to the good' (Lancaster 1971)

If this is not the case then the shadow prices derived are likely to reflect not only consumers' implicit valuations of the characteristics but also their differing beliefs about the characteristics possessed by differing goods. In health care it would seem unlikely that consumers are

perfectly informed about the characteristics of different providers, for all the reasons discussed above. Bowbrick (1992) suggests that not just in health care, but in many markets the conditions described above are unlikely to hold. Indeed marketing theory explicitly assumes that it is possible to create in consumers' minds a set of characteristics subjectively associated with a product which may bear little relationship to the objective characteristics of the product. Given the extremely high degree of product diversity in modern markets, it would in most industries seem unrealistic to expect consumers to be perfectly informed about the characteristics possessed by different products.

Finally the characteristics approach implicitly assumes that consumers have clear preferences over the characteristics embedded in a product. It is questionable whether this is always the case, particularly with a service such as health care. There may be considerable psychic costs to patients in making decisions between different providers and patients may prefer to not act in a rational and sovereign manner, but rather to simply place their faith in a particular provider.

On a conceptual level the characteristics approach would appear to provide a suitable tool for analysing product differentiation and imperfect information in health care markets. However there are clearly considerable problems in applying the concept empirically. Estimates of hedonic prices need to be treated with caution.

2.4 MODELS OF COMPETITION IN HEALTH CARE MARKETS

US interest in competition in the health care sector developed during the 1970s as health economists attempted to address the question of how best to contain rapidly spiralling health care costs. Two alternative schools of thought developed. Enthoven (1978) and others argued that market forces could be used to contain hospital cost inflation as the demand constraint was binding. In opposition it was suggested that in health care, market solutions were inappropriate due to acute problems of imperfect information and government intervention was the only answer (Evans 1974, Reinhardt 1985). This debate has generated a substantial amount of empirical work and a number of models describing competition in health care. There is generally an implicit, though not always clearly stated, link between these models and the micro-economic theories of imperfect information described above. The health sector specific models of competition all assume that an element of imperfect information on the part of the consumer leads to imperfect competition. The strengths of the models however is that they

develop stronger behavioural hypotheses about how hospitals compete and thus are worthwhile reviewing from this perspective.

Three main types of model are reviewed:-

i. The Induced demand model posits that health care providers are only partially constrained by the consumer demand function because of the agency relationship in health care. Thus in the face of increased competition in the market place, instead of accepting lower profitability, providers attempt to shift the demand curve outwards. This is done through increasing the intensity of service provision. In some respects this model assumes health care providers have greater market power than even monopolists who, it should be recalled, faced a fixed demand curve. However profit maximization is rarely suggested. The 'Target Income Hypothesis' suggests that health care providers wish to maintain a certain level of income. Under increased competition providers will shift the demand curve to the extent needed to re-attain target income levels (Evans 1974). During the 1980s and 1990s health economists have become increasingly sceptical that physicians have anything like the degree of discretion implied by the Target Income Hypothesis. Zweifel (1981) suggests that the medical ethics of the health care providers act as a constraint. In order for health care providers to induce consumers to buy more services they must provide them with information which is rather less accurate, however there is a psychic cost to doing this which deters excessive deceit.

The induced demand model does not deny a role for the informed consumer to discipline the market, however psychic constraints upon the health care provider make it unlikely that consumers will ever need to do so.

ii. The Quality Competition model attempts to explain why in the US more competitive health care markets appear to have higher costs. It is argued that because of insurance cover consumers are not very price sensitive, therefore in order to increase market share hospitals invest in quality. This tendency is exacerbated by the need to attract specialists (who are presumed to appreciate access to high-technology equipment) and who in turn attract patients. The non-profit motivation of many US hospitals contributes to the credibility of this strategy.

The presence of imperfect information affects the model in a critical way. Generally it is assumed that both consumers and institutional buyers are not concerned with the available level of technical equipment and facilities per se, but have difficulties in assessing the

procedural aspects of quality of care, and therefore focus on structural aspects, such as buildings and equipment. Thus the hospital could be seen to be using technical equipment as a signal to the market. However for such a signal to be a credible one, it must be lower cost for high quality hospitals to acquire such equipment. This may be the case if only high quality personnel know how to operate such equipment, and higher quality hospitals have better quality staff. For a hospital to be able to signal effectively to the market that it has a higher level of quality of care, its signal must stand out against the background noise. There is thus a real danger that hospitals invest more and more in signalling, with little effect (Robinson 1988). This would be a classic example of Spence's exogenously costly signal.

iii. The Increasing Monopoly Model is essentially a search model that views health care as a 'reputation good' meaning that

> ' (a) sellers products are differentiated and (b) consumers' search amongst sellers is conducted primarily by asking relatives, friends and associates for recommendations.' (Pauly and Satterthwaite 1981)

It is hypothesized that if the number of health care providers in a market area increases then consumers will find it harder to collect information about a particular provider. Therefore consumers will become less sensitive to price and the equilibrium charge will rise.

Pauly and Satterthwaite (op cit) suggest that this model best fits the primary care setting where a relatively straightforward and constant relationship exists between the characteristics of the provider and the services offered. For hospital services, inpatients may be admitted to different wards and be treated by different consultants for different conditions. Thus reputation in terms of services may be less reliable at the hospital than at the primary level. However a consumer may still seek information from acquaintances about hospital characteristics.

These three models have all been used to explain the same 'stylized fact', that is that less concentrated markets, where competition would be expected to be higher, often exhibit higher costs. Although they are 'alternative' explanatory models, there is no logical reason why they should be mutually exclusive.

Although these models provide a much clearer explanation of **how** imperfect information affects health care markets, they have a common weakness. The models conceive of the provider unit as a singular cohesive unit. In reality the internal organizational structures of health care providers, and hospitals in particular, are complex. Frequently the strategic long

term management functions are quite distinct from the physicians who have day to day authority over resource use (McGuire 1985). This affects the supplier induced demand model in particular. The incentive for physicians operating in hospital settings to induce demand depends entirely upon how they are paid.

A related point concerns the assumed motivation of provider units. The supplier induced demand model in particular, assumes that the primary motivation of providers is profit. The quality competition model allows the possibility that hospitals pursue quality and/or reputation as well as or instead of profit. The appropriateness of the profit-seeking assumption clearly depends to some degree on the range of providers in the health care market. In the US, for-profit hospitals only account for about 10% of the total number of acute hospital beds (Schlesinger et al 1987), and thus the assumption seems questionable. Amongst non-profit providers a very wide range of motivations have been postulated including cost recovery, output maximization, output and quality maximization, utility maximization and cash flow maximization (Davis 1972). It is unlikely that these objectives could all be pursued through quality competition alone. As discussed earlier, even for for-profit firms, profit maximization may not be the sole objective.

With these caveats in mind the following section describes the empirical application of these models.

2.5 EMPIRICAL APPLICATION OF MODELS OF HEALTH CARE COMPETITION

Empirical testing should determine which of the models is the dominant one. Unfortunately the predictions of the models are not always clearly differentiated (see Table 2.1). For example, if in response to a decrease in market concentration, prices are seen to rise this would directly refute the traditional model, but may not shed light on alternative models. It may be that because of higher search costs consumers are less price sensitive and providers have been able to increase fees. Alternatively physicians may have responded by increasing service intensity, which may also have the net effect of raising total fee charged. Furthermore it is possible that more intense competition has led to investment in quality which may in turn generate higher nominal prices (though not necessarily higher quality adjusted prices). If all four key variables (price, provider income, quality and service intensity) are examined it may be possible to gain a clearer (though not necessarily conclusive) idea of the form of competition prevailing. As it is quite possible that more than one form of competition is

prevailing in the market at the same point in time, such opacity is not surprising.

Table 2.1

The effect predicted by different models of a decrease in market concentration

Model / Variable	Traditional model	Induced demand	Quality Competition	Increasing Monopoly
Fees/price	-			+
Provider income	-			+
Quality			+	
Service intensity		+		

KEY: - decrease in variable
+ increase in variable
blank space indicates no impact or unclear impact

SOURCE: Adapted from Reinhardt 1978.

Much of the empirical testing of the induced demand model has examined whether a higher density of physicians leads to higher service intensity. Both Fuchs (1978) and Cromwell and Mitchell (1986) found greater surgeon density to be associated with increased surgical intervention per capita. However such direct inferences ignore that (i) more specialist services are likely to be located in urban areas where there is a higher physician density (ii) in such urban areas the time costs to patients of seeking care may be lower and thus there may be greater demand from patients (Feldman and Sloan 1988). Rice and Labelle (1989) question whether the correct test of the theory is an examination of the interrelationship between physician density and quantity of services provided. They suggest that physicians will only induce demand if increased competition (ie. higher density) results in lower prices. The continuing debate about more or less appropriate ways of testing for supplier induced demand means that the empirical evidence remains mixed and inconclusive.

The presence of quality competition in health care markets has mainly been explored through examining how levels of (i) excess bed capacity (ii) staffing levels and (iii) medical facilities maintained by hospitals vary according to measures of local competition. It has been suggested that excess bed capacity attracts physicians as they are unlikely to encounter problems in admitting patients. Empirical research has suggested that all three of these

measures tend to be higher in markets where there is lower concentration, that is that quality competition is a prevalent phenomenon (Robinson 1988). The models described above shed little light on the behavioural determinants of quality competition. In a rather more sophisticated analysis, Chirikos (1992) models hospital managers as aiming to maximize quantity (measured by market share) and quality (measured by expenditure to raise input intensity and/or deepen capital stock). The results suggest that quality spending is higher in more competitive markets and that in turn quality spending tends to increase market share.

Empirically the level of consumer information is consistently found to be a significant variable affecting competitive intensity. For example Pauly and Satterthwaite (1981) regress price on a vector of variables including proxies for the 'ease of gathering information'[4] and find these proxies to be very significant. However, attempts to compare the increasing monopoly model with other models cast doubt upon its validity. Cromwell and Mitchell (1986) test the impact of various influences on price and find that although provider density per capita is highly significant the number of providers per square mile is not. They take this to be an indication of the superiority of supplier induced demand explanations over those based on the increasing monopoly model. The validity of the increasing monopoly model clearly depends on quite how information transfer is modelled. Pauly and Satterthwaite are rather vague:

> 'If the number of primary care physicians in a community is small - three for example, - then each physician has a detailed reputation throughout the community. Each consumer is likely to have friends who go to the three and can remember what the friends have reported about each. If, however, the number of physicians in the community is larger - thirty, for example - then each one's reputation is less defined.' (Pauly and Satterthwaite 1981)

There are however a number of models of search which break the link between a larger number of providers and higher search costs; consumers may search for a new provider by asking family or friends for a single recommendation, or faced with a large number of potential providers, consumers may focus search efforts using a simple rule of thumb, such as proximity or price. The lack of empirical evidence to support the behavioural foundations of the model are problematic

[4] In the Pauly and Satterthwaite model the proxies are (i) the percentage of newly arrived households in the area and (ii) the number of single headed households. Both of these proxies are postulated to be associated with greater difficulties in information collection. Frech and Woolley (1992) add the percentage of households with telephones. Telephones are assumed to make search activities easier.

and hence which proxies are used in empirical testing. In the original article information acquisition was modeled in a bizarre way; it was assumed that consumers would first select a health care provider and then ask around for information. In practice it would be at least as acceptable for consumers in search of a new provider to ask family and friends for recommendations. With such behaviour, once the number of providers is already large, there is no reason for search costs to increase with the number of providers. The lack of empirical evidence to support the behavioural foundations of the model are problematic.

Many of the more recent studies integrate two or more different models, often incorporating a role for traditional economic theory and its predictions relating to market concentration.

For example Frech and Woolley (1993) suggest that price may not be the appropriate variable to use to distinguish between the traditional model and the increasing monopoly model. If increased concentration leads to lower quality then even under the traditional economic model, prices may fall. The key test of the traditional economic model is whether increased concentration leads to an increase in the price-cost margin. Their empirical results suggest that in more concentrated markets quality declines but there is little change in price. Overall this leads to higher price-cost margins consistent with the traditional model. Frech and Woolley's analysis does not provide any evidence to support the increasing monopoly model (ie. prices do not appear to go down in more concentrated markets) but the information variables included in the model are strong and significant. The authors conclude:

> 'Consumer information is important in explaining hospital prices, and less important in hospital quality. Consumers are not passive; they do play a role in hospital choice.' (Frech and Woolley 1993)

Noether (1988) also observes that if price and quality competition occur simultaneously then the effects may offset each other. Lower concentration may push prices up through quality competition and lower them through standard price competition. Price-cost margins must be examined for a conclusive result. Noether's empirical work suggest that both price and quality competition intensify in less concentrated markets, but the magnitude of the impact of concentration is small.

McCarthy (1985) further supports the relevance of traditional economic theories in the primary care market. Price, waiting time and physician density all negatively affect demand (as measured by the number of hospital visits). McCarthy suggests that this shows that the market

does act as a constraint upon physician behaviour. However the approach used does not rule out the possibility of demand inducement within a visit ie. through greater service intensity.

Van Doorslaer's (1987) adapts the induced demand model to allow for a stronger role for consumer information. Although this model does not fully integrate the increasing monopoly model it takes on board some of the assumptions that the increasing monopoly model is based upon ie. health care is a reputation good and seeking information on health care providers is a costly process. Van Doorslaer suggests that consumers have a known (subjective) probability distribution for the impact of medical care on health status. It is assumed that this probability distribution is normal with a positive variance. Consumers may attempt to get a more accurate estimate of the probability distribution through a variety of means, including personal observation and experience, observation and the experience of others, and purchased expert medical care. These extra sources of information will be purchased to the point where their expected marginal utility outweighs their marginal cost and will be integrated into the individual's a priori probability distribution function. The more informed the consumer, from these various sources, the harder it is for physicians to induce demand. Empirical testing suggests that better informed individuals do indeed have significantly less physician initiated contacts, although they themselves are more likely to consult a physician. Coyte (1985) presents a similar model where consumers monitor physicians up to the point where the marginal benefit of doing so outweighs marginal cost. Physicians adapt their behaviour accordingly and will act opportunistically to the extent that consumer information allows this. Coyte's model is not empirically tested.

2.6 CONSUMERISM

To varying degrees the models described above assume that patients exert some discipline over the market through selecting providers who offer value for money. Thus it is assumed that patients act like consumers. If this were not the case, and for example patients were not sensitive to price or quality, then the implications would be substantial. Neither price nor quality competition would be likely to occur as patients simply selected the nearest or most physically accessible provider. Strong challenges have been made to the notion of consumer sovereignty in health care. It has been argued that patients appreciate having the responsibility of decision making removed from them and placed in the hands of a doctor (Press 1978) and that often when seeking health care people are physically weak and therefore simply unable to carry out normal consumerist behaviour (Campbell 1990). The extent of consumerist behaviour is clearly an empirical question the answer to which will vary according to cultural

norms and the structure of the health care system being studied.

In Western Europe and the US there has been increasing interest in the role of consumerism in health care. Several of the recent health care reforms in these countries have explicitly given patients a role in driving competition between health care providers. In the UK patients choose between GPs whom, in turn, may (if they are budget holders) choose the source of hospital services for their registered patients. If patients seek out the GPs who offer the best services then there is an incentive for GPs to act efficiently. In Sweden consumer choice of provider has been institutionalized during the 1990s, although links between patient choice and provider unit budgets have not always been clear cut (Saltman and von Otter 1992). In the US some of the approaches to cost-containment were demand side oriented, using co-payment mechanisms to constrain utilization. Such reforms have prompted a number of recent studies investigating the extent to which consumers exert market discipline through their choice of provider. This research has taken place solely within industrialized countries, however it sheds light on the question of how and why people choose their health care provider and the interface between these micro-level decisions and the functioning of the market as a whole.

Many varied definitions of consumerism have been offered. Hibbard and Weeks (1987) identify three main elements of consumerist behaviour (i) **knowledge**, including both the current possession of knowledge about health care services and the willingness to seek further information to supplement this knowledge (ii) **attitudes**, particularly willingness to use independent judgement rather than simply submit to the direction of a doctor and (iii) **behaviour**, in particular cost and quality sensitivity. Lupton et al (1991) suggest a slightly different definition including bargaining power, freedom of choice, knowledge, motivation to choose and power to challenge medical authority. This definition emphasizes more the institutional environment required for consumerist behaviour to occur. Lupton et al also quote from an Australian health care consumer handbook which gives the following advice:

> 'Know what you want, shop around and if the service is unsatisfactory take your business elsewhere or seek redress.'

This advice brings in an important additional element of knowledge which is that consumers need to know what they seek in a health care provider, otherwise information will be of little relevance.

The empirical studies explore different aspects of consumerist behaviour. From the literature it is possible to identify the following foci:-

- Possession of 'broad' health knowledge about disease causation, illness symptoms, appropriate treatments etc.;
- Possession of health system knowledge, for example concerning the characteristics of different health care providers or about how the system as a whole functions;
- Information seeking behaviour;
- Price and quality sensitivity;
- Independence from medical advice in decision making;
- Characteristics sought in choosing a health care provider.

Studies have also attempted to determine which socio-demographic characteristics are likely to encourage people to act in a more consumerist manner. Many of the studies have researched decisions relating to primary care providers. This is because in the UK, the US and Australia where the studies have been situated, consumers have freedom of choice between primary physician but not necessarily between different hospitals.

Studies of **broad health knowledge** have hypothesized that without such knowledge it is difficult for a consumer to make a rational choice of health care provider. In addition, Newhouse et al (1981) suggest that health knowledge places consumers in a stronger negotiating position with providers during health care consultations.

Charny et al (1990) used data from the Cardiff Health Survey to construct four knowledge scales (a health knowledge scale, an illness symptoms scale, a disease causation scale and an appropriate action scale), with the purposing of assessing whether greater health knowledge is likely to lead to more appropriate action in the event of illness. Individuals' broad health knowledge and knowledge of disease causation did not apparently lead them to make more appropriate decisions about what actions to take in the event of illness. However the illness symptoms scale was found to be associated with appropriate action. Newhouse et al (1981) constructed a ten item 'consumer sophistication' scale which included both broad health knowledge dimensions and more specific questions about the health care system. For example amongst the latter category respondents were asked how strongly they agreed or disagreed with the following statement 'You may be able to tell how good a doctor is by finding out if he is certified by a special board.' On the basis of this Newhouse et al suggest that consumers are rather more knowledgeable about decisions made during the course of a consultation (eg. they have a suitable degree of scepticism about the necessity of operations) than about issues which would help them to choose a provider. However the comparability of the two scales

is not established and the basis for this assertion appears weak.

In marketing and advertising literature a clear distinction is made between different phases of knowledge acquisition by the consumer (Bowbrick 1992). If people think that at some point in time they might need to purchase a particular product or service, then it is likely that they will possess some general level of knowledge about it. However before actually purchasing a good or service people are likely to engage in more intense information seeking behaviour to supplement the general knowledge which they already have. Thus it may be inappropriate on the basis of general studies of consumer knowledge (such as that by Newhouse et al 1981) to conclude that people are poorly informed. Studies examining the knowledge base on which particular health care seeking decisions are probably more valid.

Two UK studies have explored **health care system knowledge** by enquiring as to how specific health care utilization decisions were made. Higgins and Wiles (1992) surveyed a sample of patients who had elected to have private hospital treatment. Although the majority of respondents claimed that they had used private care to escape NHS waiting lists few knew how long the waiting lists were. In a survey of people newly registering with GPs Salisbury (1989) found that most said they had chosen the practice because it was the nearest to their home, however there was frequently a practice unknown to the respondent which was even closer.

Booth and Babchuk (1972) examine **information seeking behaviour** in selecting a provider. The researchers focused upon the over forty-fives and in particular those who had recently sought care from a new provider[5], and examined how this choice had been made. Mass media had played a very limited role in influencing choice as it tended to provide general health messages which were not sufficiently tailored to individuals' concerns. Instead personal contacts, particularly with relatives and friends played a major role in influencing choice of provider. Few respondents sought advice from doctors. The most influential advisors tended to be friends, of a similar age and background, and in particular those who had had first hand experience of the service being considered.

[5] The definition of provider used in the Booth and Babchuk study is a broad one ranging from a new doctor to a new welfare services such as meals on wheels. For the latter type of service informational problems are probably not as acute as they are for clinical care and therefore seeking advice from friends rather than a professional may be a more obvious strategy.

The importance of friends and relatives in providing information about providers is supported by UK studies. Nearly 50% of Salisbury's sample had first heard of the practice with which they registered through a neighbour or friend. In choosing whether or not to use a private hospital, general practitioners were rather more important, but friends and relatives still had a significant role, particularly where they had undergone a similar treatment (Higgins and Wiles 1992).

Price sensitivity is a central characteristic of consumerist behaviour and yet the empirical evidence on price sensitivity in health care seems remarkably mixed. Studies in both industrialized and developing countries have suggested that the poor are sensitive to the price of health care and will reduce their demand in response to higher relative prices (Gertler and Van der Gaag 1990, Litvack and Bodart 1993, Manning et al 1987, Waddington and Enyimayew 1989 and 1990). However analyses of decision making processes suggest that at least amongst the US population, price sensitivity in health care is not a general rule. Of a sample of 2000 US respondents (approximately half of whom were Medicare enrollees) only 39% reported engaging in any **one** of the following activities (Hibbard and Weeks 1987):-

- using physician fees as an important criterion when selecting a physician
- choosing not to see a physician when ill because of costs
- not following doctor's order because of costs
- asking about fees in discussion with a doctor.

In a follow up study a sub-sample of the same population were provided with a physician fee directory listing fees for area providers. Although those with the directory appeared to be better informed on prices than the control group there was no detectable difference in their health care utilization patterns (Hibbard and Weeks 1989). In the UK 62% of the sample seeking private hospital care did not know how much the treatment would cost and 70% of the insured did not know whether a co-payment would be required (Higgins and Wiles 1992).

Rice et al (1992) investigated price sensitivity in the US through an evaluation of the Medicare 'Participating Physicians Program'. Under this programme, physicians were prohibited from charging the patient more than Medicare approved rates. A telephone survey found that of Medicare enrollees less than 10% of the sample had switched physician during the past year, and of those who had, only 5% had switched for economic reasons including a meagre 1% who had switched to a physician working under the program. Moreover the majority of respondents said that they would not consider switching to a physician working under the programme.

Obviously in the US insured persons only bear a fraction of the full cost of care. The level of co-payment appears to be affordable for most, and under these circumstances individuals seem reluctant to consider the price of care when selecting a provider.

Few of the studies considered **consumer independence from medical advice**. Only Hibbard and Weeks (1987) address this and theirs is a rather simplistic measure. Only 34% of respondents said that they would not always strictly follow the advice which doctors gave them.

Finally considerable work on **what consumers look for in a health care provider** has been completed. Lupton et al (1991) asked a series of open ended questions including why people chose their GP, why they continued to use them and what makes a good or bad doctor. Calnan (1988) used in-depth interviews with twenty women to explore what they thought constituted good and bad doctors. Overwhelmingly the evidence from these surveys points to the importance of good interpersonal relationships. Medical competence and knowledge is awarded some importance, but comes second to a sympathetic manner, good listening ability and communication skills.

Overall, the evidence emerging from studies of consumer behaviour in health care suggest that the archetypal image of the active consumer exercising independent judgement and seeking out high quality low price care is an inaccurate picture, at least in the industrialized countries where these studies have been undertaken. The limited degree of consumerism exhibited by health care users suggests that unless other agents (such as third party payers) are influential, there is only limited stimulation of competitive forces in the market. The apparently low levels of information amongst consumers, and their lack of willingness to monitor providers may create scope for providers to be imperfect agents, unless their behaviour is bounded by other factors such as professional ethics.

2.7 SUMMARY

The central issue in the debate about the public private mix for health care is the degree to which health care markets stray from the perfectly competitive model. This chapter has attempted to clarify the mechanisms through which such markets may fail and to consider the resulting forms of competition. Key factors affecting the form and extent of market failure are:-

- **the extent of asymmetric information**: imperfect information on the part of the consumer gives rise to a number of critical problems. If consumers are imperfectly informed about the characteristics of providers and there is product differentiation between providers then consumers are unlikely to seek out the products or services in the market which most closely match their own preferences and offer good value for money. Alternatively consumers may be able to select a good provider, but then are poorly informed about the nature of the service they require. Several of the other elements discussed below derive their importance from this fundamental problem of asymmetric information.
- **the extent of product differentiation**: if product differentiation is a dominant force in the market then barriers to entry may occur and firms within the market are likely to be able to make positive profits. Product differentiation combined with asymmetric information exacerbates difficulties consumers face in selecting a provider.
- **the magnitude of search costs**: if accurate information about providers in the market is freely available then imperfect information is not a problem. The higher the costs of seeking information, the more problematic asymmetric information is likely to be.
- **the effectiveness of provider signals**: in the face of imperfect information high quality providers are likely to try to signal the quality of care which they offer. Signalling mechanisms may be effective, but in the health care market this is unlikely to be the case. The more important signalling is seen to be by providers the more resources will be diverted into it.
- **the willingness of patients to act in a consumerist manner**: a number of different dimensions of consumerism have been identified. It is not necessarily the case that consumers will act consistently across all these dimensions. For example consumers may be very sensitive to the quality of care and may seek out information on this, but at the same time they could be relatively insensitive to price, and incapable of making medical decisions independent of their physician.

The importance of these factors in health care markets is an empirical question which could be approached from two angles. Studies such as those described in sections 2.4 and 2.5 above have taken a market level approach looking at market concentration, availability of information and how this affects a range of variables such as price, quality and profitability. An alternative approach would be to look at the underlying factors, in particular consumer knowledge and behaviour and how this influences the market. There are likely to be close connections between individual behaviour and the behaviour of providers, for example hospital

advertising will affect consumer knowledge, consumer price sensitivity will affect the way in which hospitals compete.

In examining the extent and nature of market failure it is necessary to be specific about the market under consideration. Market failure will vary across different types of health care services. Pauly (1978 and 1988) distinguishes between different types of medical care markets where (i) the market works reasonably well (ii) the market doesn't work well and (iii) where it might work well given an appropriate competitive framework. Services fall into one of these three categories according to the frequency of purchase and the knowledge the typical consumer has about both the value of the service and its appropriateness for different conditions. Thus for simple primary care such as childhood vaccinations or treatment of diarrhoea, the high frequency of purchase and the lesser extent of asymmetric information means that the market is likely to work substantially better than for chemotherapy for cancer.

Similarly the extent of market failure is likely to vary according to the health care system. Both provider and consumer conduct will vary according to the structure of the health care system (Evans 1981) and also prevailing cultural norms. All of the empirical studies discussed in this chapter have considered industrialized societies which may have quite different health care systems and cultures to that found in the developing world. In order to consider the relevance of the theories discussed in this chapter to Bangkok, a much clearer idea of the nature of health care markets in the developing world is required. In chapter 3 the focus shifts to the developing world.

CHAPTER 3
URBAN HEALTH CARE MARKETS IN THE DEVELOPING WORLD

3.0 INTRODUCTION

The models of hospital competition discussed in Chapter 2 have been largely developed and tested in the US. The structure of the health care system, the ethos of health care workers and cultural attitudes towards health will vary betwen countries and will inevitably affect the way in which the market for hospital care operates. This chapter tries to give a flavour of the nature of health care markets in the developing world, particularly in urban areas, and how they differ from health care markets in industrialized countries. There are clearly considerable dangers in generalizing about the health care systems of many diverse nations, but certain similarities do exist in the institutional arrangements of many developing countries; where this is not true comments are tied to a particular country or group of countries. The second part of the chapter focuses upon the health care situation in Bangkok. Besides orienting the reader to the situation in Bangkok, we aim to show how typical or atypical Bangkok is of cities in other developing countries.

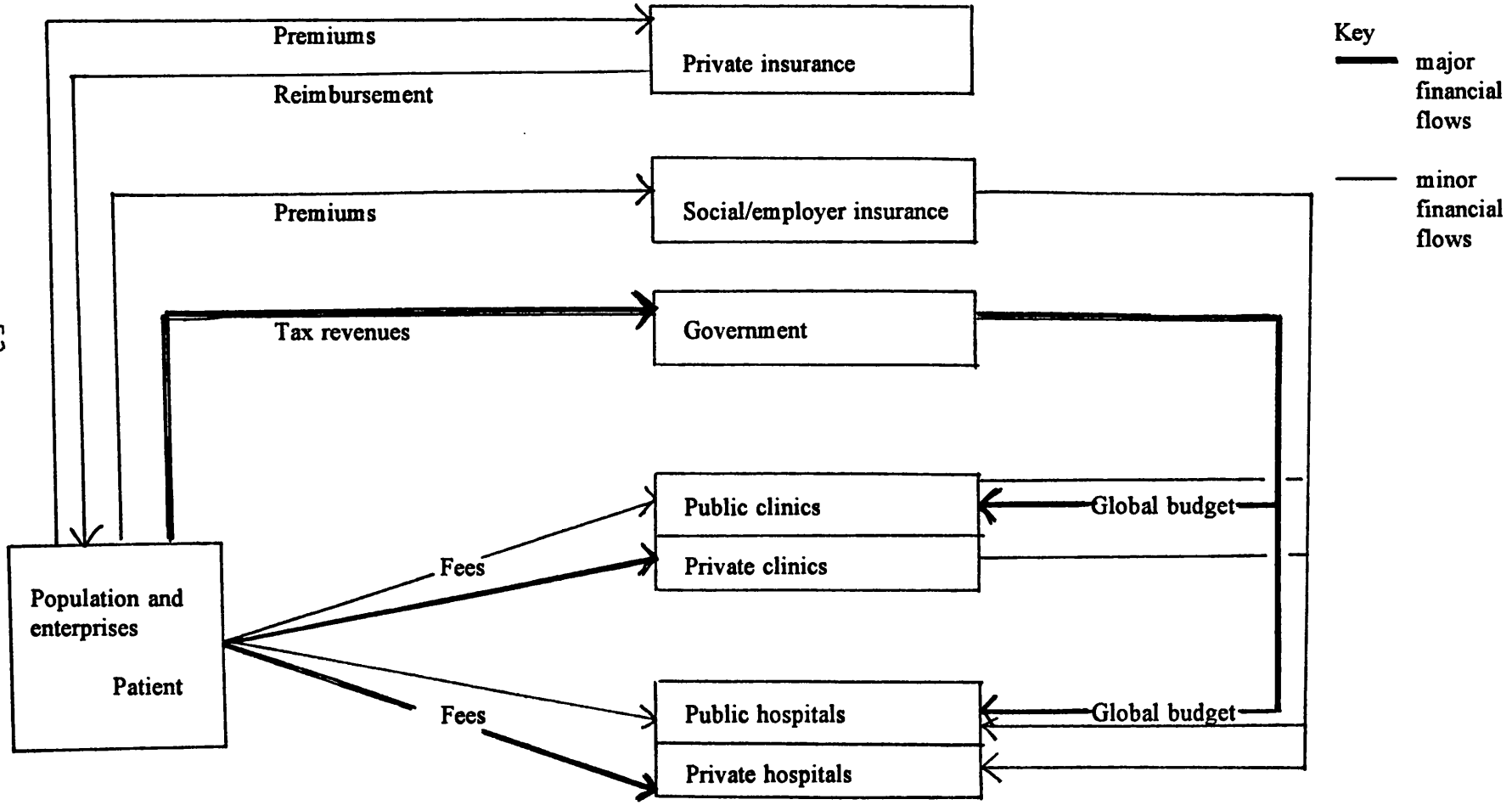
3.1 DEVELOPING COUNTRY HEALTH CARE MARKETS - AN OVERVIEW

Figure 3.1 outlines the typical organization of developing country health care systems. At first glance such systems appear to be structurally similar to those in the industrialized world, however considerable differences lie in the significance of various relationships and the importance of different agents.

There is a wide variety of health care providers in developing countries, in particular figure 3.1 separates out public and private providers, and primary and hospital levels. In the poorest countries (much of Sub-Saharan Africa and South Asia) private providers are most common at the primary level, however in middle income countries (such as those of South-East Asia and Latin America) the private hospital sector tends to be larger and is often growing rapidly. In middle-income countries private hospitals have greater financial viability due to the population's higher ability to pay, more widespread insurance coverage and easier access to credit on the part of investors.

For public health care providers the main source of income is likely to be government revenue which is commonly paid by global budget to providers, however for private providers the main source of finance is generally out-of-pocket payments from patients. Although social

Figure 3.1
Financial flows in a typical developing country health care system



insurance, private insurance and employer based insurance schemes all exist in developing countries, their coverage is often limited and only a small proportion of out-of-pocket payments by patients are likely to be reimbursed by any of these forms of insurance.

On paper, referral mechanisms between public primary level and public secondary level providers normally exist, although they operate with varying degrees of efficiency. It is much less clear how private providers fit into referral systems (Aljunid 1995). Commonly there are no established referral systems between public and private providers or indeed within the private sector.

Regulatory responsibilities are normally carried out by several different agents including government bodies and private organizations such as professional bodies. Often the regulatory efforts of such bodies are focussed upon health care providers and fewer controls are exerted over the financing agencies.

The following sections review each of the main agents within the health care system (providers, financers, patients and regulators) in more detail.

3.1.1 Providers

Most city dwellers in developing countries, and some living in rural areas, have a wide choice of providers from which to seek health care including government clinics, government hospitals, private doctors, private pharmacies, traditional healers of many sorts, private hospitals owned by both non-profit organizations and owned by investors (Bhat 1991a, Berman et al 1987, Green 1987). These providers differ not only in their ownership and the level of the health care system at which they operate, but also in the quality of care provided and the type of medicine practiced. There is thus considerable horizontal product differentiation across providers. This diversity exists for a number of reasons. It is partly due to people's preferences. In many lower and middle income countries people demand both traditional and allopathic forms of medicine. In Taiwan for example both Chinese medicine and allopathic care are covered by social health insurance (Su 1995). Providers may specialize in one approach or may use a mixture of approaches. Some governments have actively encouraged the role of traditional providers within the health care system because of the shortage of trained allopathic personnel.

It is possible to conceptualize this in terms of Lancaster's characteristics model with different

providers offering a different mixture of characteristics. For example several authors have suggested that the main difference between public and private allopathic medical practitioners is that private care tends to be more convenient and comfortable, whereas public care may be stronger in terms of clinical quality (Culyer 1982, Naylor 1988). Both public and private Western style providers may be weak in terms of providing information and communicating with the patient, as well as in the caring role. In contrast traditional healers often perform an important role in terms of providing information and relieving stress, even if the clinical quality of care associated with this service is low (Kleinman 1980).

Vertical product differentiation between providers is also substantial. For example in Bombay it was said that:

> 'The private facilities range from modern sophisticated hospitals serving the needs of affluent classes to clinics operating in dilapidated rooms in slums run by semi-qualified people.' (Yesudian 1994:74)

The contrast in the standard of care available is perhaps particularly acute in India, but a wide range of different standards of care is found in many other developing countries. These differences are perhaps rooted in the greater socio-economic inequities commonly present in developing countries (Kuznets 1955). One consequence of the wide variation in the standards of care provided is that some providers may offer exceedingly poor quality care. A recent committee of enquiry into private nursing homes in Bombay included the following amongst the list of problems identified:

- One seventh of the nursing homes are in sheds or lofts in slums;
- Less than one third have qualified nurses;
- Some do not disinfect the operating theatre more than once a week;
- None incinerate any infectious waste material, but instead drop it in municipal bins;
- Over a third of all wards and half of beds in them are dirty and most are poorly lit. (Yesudian 1994)

Services provided in such facilities may do more harm than good to an individual's health status.

Problems of unacceptable standards of care are not confined to the bottom end of the market, a major concern at all levels of the market, but perhaps particularly in facilities serving wealthier clients is the use of unnecessary diagnostic tests, surgical interventions or pharmaceuticals. In Brazil for example far higher rates of Caesarian sections were found amongst private patients than uninsured ones (Barros et al 1986). McGreevey (1988)

documents a variety of forms of demand inducement, all said to be prevalent in Brazil. Yesudian (1994) discusses 'cut practice' in Bombay where unnecessary referrals are made between doctors with the referring doctor receiving a portion of the fee charged by the doctor to whom the referral was made. Uplekar (1989a and b) examined prescription patterns amongst private doctors in Bombay for the treatment of tuberculosis and leprosy and concluded that in general the physicians prescribed a considerably larger number of drugs than was required.

The reasons for low standards of care in the private sector are likely to be complex, including the lack of continuous education for health care staff, weak regulation, poor support for investment in facilities etc. but financial incentives combined with the for-profit orientation of many health care providers in developing countries is probably a significant factor. It is difficult to obtain data about what percentage of facilities in private ownership have a for-profit orientation, but it seems that the picture varies substantially across regions. In Sub-Saharan Africa non-profit organizations, particularly mission facilities, often provide around 40% of total health care contacts (Gilson et al 1994). In many Western European countries and the US the private sector is dominated by non-profit organizations. However in Asia private for-profit providers often make up the largest proportion of the private sector. In India, for example, in 1987 it was estimated that more than 80% of private hospitals were operated on a for-profit basis, between them these hospitals owned approximately 58% of private beds (Bhat 1991a) At the primary level many of these for-profit providers are small family run businesses. For larger hospitals, investor-owned companies are more significant. Furthermore in many Asian countries supposedly non-profit foundations are often run along very similar lines to for-profit ones.

The evidence relating hospital ownership to quality of care is ambiguous. There is little clear evidence that for-profit ownership adversely affects quality of care (Shortell et al 1988), but it appears that for-profit providers respond more to financial incentives (Gaumer 1986). Thus it is possible that faced with fee-for-service based remuneration, for-profit providers in developing countries may respond by either providing low quality care in order to reduce their own costs, or over-servicing the patient in order to increase revenues.

3.1.2 Financers

The fortunes of private providers are commonly closely linked to health insurance coverage (Ngalande-Banda and Simukonda 1994, Price 1989). Indeed one author commented that:

'The single most important factor determining the feasibility of greater private sector involvement in health service provision is the potential for insurance coverage.' (Griffin 1989)

However it is also clear that the private health care sector often flourishes in conditions where there is extremely limited health insurance, or at least limited health insurance providing access to private providers. In Latin America many national health insurance schemes were established early this century (McGreevey 1990) and now cover a substantial proportion of the population. However they are frequently based upon a direct model of delivery, ie. the social security institute has its own facilities through which care is provided, and hence those who seek care privately commonly pay for it out of their own pocket. In Mexico although 55% of the population are covered by health insurance approximately 37% of health care contacts were found to be in the private for-profit sector not covered by the social insurance scheme (Cruz and Zurita 1993). In much of Asia health insurance schemes are very poorly developed (Ron et al 1990) and yet extremely high utilization of private providers is evident, particularly at the primary level. For example India and Pakistan both have health insurance coverage of no more than 5% of the population but approximately 70% of health care contacts are estimated to be in the private sector (Bhat 1991a, Mohammed et al 1993). A study of private practitioners in Jamaica showed that 60% of their income came direct from patients on a fee-for-service basis, 25-30% was reimbursable by private health insurance schemes and the remainder was covered by special arrangements such as employer schemes (Cumper 1990). It is probable that in many developing countries some informal risk pooling mechanisms operate, for example through lending within the extended family. In many low and middle income countries a minority of the work force are in formal sector employment and this, despite innovative schemes attempting to cover informal sector workers, often forms a natural limit to the coverage of social and employer based schemes.

Where sizeable third party payer organizations do exist they often have limited bureaucratic capacity. Bureaucratic inefficiencies are reflected in, for example, high administrative costs and late reimbursement of expenditure. In Western Europe administrative costs for social health insurance schemes are often around 5% of revenue, in Latin America they are reported to go up to about 28% and in Mali were said to amount to 50% (WHO 1993). An important implication of this is that even where insurance schemes with substantial population coverage exist in the developing world they are often unable to act in a way which encourages appropriate behaviour on the part of providers. Recent reforms in Western Europe and proposals for reform in the US emphasize the potentially powerful role of purchasers of health

care in the market place (Enthoven 1988, Culyer et al 1990). Through negotiations with providers, medical review and medical audit, health insurance organizations can help to ensure an appropriate standard of care at a low cost for their clients. This may even have spill-over effects benefitting the uninsured part of the population. However adequate information systems and sufficient bureaucratic capacity are required to achieve this. All too often these are lacking in developing countries (Kutzin and Barnum 1992).

Stronger health insurance organizations and more widespread insurance coverage would not only be able to enforce discipline upon providers through mechanisms such as medical audit etc but may also help to set incentives for providers through the structuring of the payment mechanism. The great majority of uninsured patients pay private health care providers on a fee-for-service basis. Fee-for-service systems have an inherent tendency to encourage the over-provision of care, leading potentially to problems of cost-escalation and unnecessary servicing. In contrast insurance schemes both in industrialized countries and in the developing world are increasingly experimenting with prospective forms of payment designed to contain costs (WHO 1993).

3.1.3 Patients/consumers

Expansion of the private sector is commonly said to benefit only the rich. Several studies have explored the truth of this assertion. There is certainly considerable evidence that higher income groups tend to use private providers more than lower income groups. For example in rural Indonesia Berman et al (1987) found that the average number of contacts with a private practitioner were 0.18 per illness episode for the three lower income quartiles, but rose to 0.477 for the highest income quartile. This is supported by Heller's findings in Malaysia where logistic regression analysis showed that higher income levels were associated with a greater probability of using private providers (Heller 1982). Akin et al (1986) claim similar results in the Phillippines, although only one proxy for income (number of rooms in the house) is actually significantly associated with greater use of private providers. However in contrast to these studies others suggest that there is little, if any, difference between lower and higher income groups in their use of the private sector. In a comparative study of San Salvador and Santo Domingo based on household survey data it was concluded that:

> 'Private sector providers are visited by the poor just as often as by the rich, and the cost per visit at private providers is similar between rich and poor.' (Bitran and McInnes 1993).

A survey of patients at private clinics in Port Moresby, Papua New Guinea found that 9% of patients were earning less that the minimum wage and classified a further 51% of the sample as coming from low income households (Mulou et al 1991). Studies from India show a slight income gradient, with higher income households marginally more likely to use private sector providers than lower income households. However the overall rate of private sector utilization is extremely high. For example a recent household survey in one area of India found that in the lowest income quintile care was sought in the private sector for 72.2% of illness episodes, in the highest income quintile this rose to 95.2% (Duggal and Amin 1989).

The empirical evidence cited above shows clearly that the situation varies from country to country and even within countries. However it would appear that even if higher income households are rather more likely to use private care than lower income households, it is not exclusively their preserve. Private sector utilization by lower income households is significant. One problem with many of these studies is that the private sector is treated as a homogenous group of providers. As previously discussed this is far from being the case. The considerable diversity of health care providers in developing countries is naturally mirrored by much diversity amongst the users of the private health care sector.

Although many studies have examined consumers' choice of provider, there is a striking scarcity of literature on **how** such choices are made. An international overview of studies on the use of health care services observed that

> 'To date there have been few attempts to specify in any detail the various processes - stages and types of decisions - made in the seeking of medical care.' (McKinlay 1972)

Recently the situation has changed a little in the industrialized world where the increased interest in markets has began to stimulate studies of consumer behaviour (see Chapter 2). Despite the more widespread health care market activities in developing countries such studies are still uncommon. In developing countries anthropological studies have gone furthest in explaining how consumers in the market place choose between competing providers. It is impossible to review this vast literature here, but some key points are highlighted.

The anthropological literature suggests that in the eyes of many people in more traditional societies health is inextricably linked with mental and social well being. Thus there appears to be different levels at which ill health may be caused. Traditional societies are often equally concerned with finding out the root cause of illness as with alleviating symptoms (Zola 1973,

Heggenhougen and Draper 1990). For example people may wish to seek answers to questions such as 'Why does this afflict me and not someone else?'. Resolving such issues is often seen as critical to achieving a full recovery. As a direct consequence of such beliefs anthropologists have found extensive use of different health care providers to treat one illness episode (Helman 1990). To a certain extent, a path of multiple resort is pursued in order to increase the probability that one of the therapies will work. However frequently patients feel that different types of therapy complement each other and that seeking care from a number of providers will result in a faster recovery or alternatively will ensure a complete recovery which one provider alone could not offer. For example, as the effectiveness of Western therapeutic techniques in alleviating symptoms becomes increasingly well known in many countries, it is a resort which is more and more commonly used. However this does not prevent patients from simultaneously seeking care from traditional providers to ensure that not just the symptoms are vanquished but the very root of the disease.

Research studies suggest that people's visits to health care providers are often triggered by some form of social disharmony such as not being able to participate in a social event, or a family disagreement over the problem, rather than the symptoms themselves. For example Zola's study of outpatients in the US found that the main triggers for seeking medical aid were the occurrence of an interpersonal crisis, and perceived interference of the illness with social or personal relations, or vocational or physical activity (Zola 1973). Ben-Sira (1990) suggests that "when coming to the physician, patients have two goals; the manifest goal of solution of their health problems, and the latent goal of alleviating their anxiety". Such studies of why people seek health care shed light on the characteristics which people seek in a health care provider. Although the curing function of health care providers is the one most commonly thought of (McKeown 1986) much of the demand for health care may be a demand for information. The nature of the information required may vary between cultures (What is wrong with me? Will I improve? Why has this illness happened to me and not someone else?) but the basic need is a strong one. In addition the health care provider may relieve the patient of responsibility for the illness, displacing responsibility to external factors and thus providing the patient with reassurance.

The reasons for seeking health care and the nature of the condition will influence the type of characteristics that a patient seeks in a health care provider. Patients may also affect the bundle of health care characteristics consumed by seeking care from more than one provider. Studies of health care utilization patterns in developing countries regularly show the use of

many sources of health care (Gilson 1992, Mwabu 1985). In particular the strong clinical powers of modern medicine may be combined with the healing powers of traditional care.

Much of the anthropological literature is concerned with the use of and beliefs about traditional medicine, far less appears to have been written about modern allopathic medicine in developing countries. In some countries such as India, China and parts of Africa traditional medicine is still of considerable significance. Elsewhere its hold has weakened in favour of modern Western medicine. However even in societies where traditional medicine is no longer of great significance the anthropological literature offers insights into attitudes towards health care. The willingness to utilize different health care providers for one illness episode or to shop around between different providers is of particular interest, as it directly contradicts the notion of patients being weak consumers eager to surrender responsibility for their health to a professional. A related point concerns the variety of characteristics which people seek in health care;. much of the anthropological literature describes peoples perception's of the different characteristics possessed by traditional practitioners and modern practitioners. However in societies where traditional medicine is no longer widely used it is possible that similar differences in perception exist with respect to public and private sector providers.

3.1.4 Regulators/Government

It is fairly widely accepted that certain market failures are likely to exist in the health care sector. What is more widely debated is the appropriate response to such problems (Lal 1995, Stiglitz 1989). Despite the continuing debate most countries, both developed and developing, have some regulatory oversight of the market. Often this regulatory function is carried out by government, particularly the Ministry of Health, and professional bodies such as the Medical Association. Though regulation may cover the prices, quantity and quality of care provided (Maynard 1982), the most common focus in developing countries is upon quality (Bennett et al 1994).

North (1990) argues that one of the greatest problems facing developing countries is weak institutions which fail to eliminate adequately problems of imperfect information. In Western market economies, which have followed a gradual industrialization process there was sufficient time to adapt to new technologies. However in much of the developing world, where technologies have been rapidly imported and diffused over a compressed period of time institutional development has been insufficient. This argument rings true with respect to regulatory institutions in the health care sector. Ministries of Health in developing countries

usually have statutory regulatory powers, but they often do not have the ability or resources to exercise this power (Bartholet 1990, Mutungi 1992). Developing country governments are commonly weaker and less entrenched than industrialized country governments. There may be a tendency to government failure, particularly in the form of corruption and bribery in the licensing and inspection divisions of Ministries of Health (Klitgaard 1988). As in the industrialized world, professional organizations, such as Medical and Nursing Councils are responsible for regulating procedural aspects of quality of care. However on occasion these councils receive little or no funding, this was the case in Ghana until recently (pers comm G. Dakpallah). Some Medical Councils in India have been accused of manipulating facts and continuously postponing hearings of malpractice cases (Times of India 1992).

Where government and professional organizations are weak, consumer bodies may play an important role through placing pressure on these organizations to carry out their regulatory responsibilities in a more effective manner. However in many developing countries organized consumer groups do not exist. The transaction costs of forming such groups prevents them from developing and there is thus little external pressure upon government or professional councils (Dreze and Sen 1991).

3.2 THE MARKET FOR HEALTH CARE IN BANGKOK

In many respects Thailand is not a typical developing country. It has never been colonized. It is a middle income country with a GNP of approximately US$2,400 per capita (World Bank 1996), yet its population remains predominantly rural. During the past 25 years the government has frequently been changed by coup d'etat, yet nearly all of these have been bloodless and the country, both economically and socially appears remarkably stable. Perhaps the main fact however which distinguishes Thailand from many other developing countries is the extraordinarily rapid economic growth which has occurred during the past fifteen years.

3.2.1 Economic growth and health care in Bangkok

As table 3.1 shows, rates of GNP growth during the 1980s averaged about 6%, and were particularly strong during the 1987-1990 period, averaging over 11% per annum (Robinson et al 1991). The engine of economic growth has been small scale industry and services. Despite the changing structure of production nearly two thirds of the workforce are still primarily engaged in agricultural activities. Industrialization had led to rapid urbanization, in 1960 only 13% of the population lived in urban areas, by 1991 this had increased to 23%.

Nevertheless the percentage of the population living in urban areas is still low compared to countries of a similar economic status.

Table 3.1

GDP Growth in Thailand 1980-1990

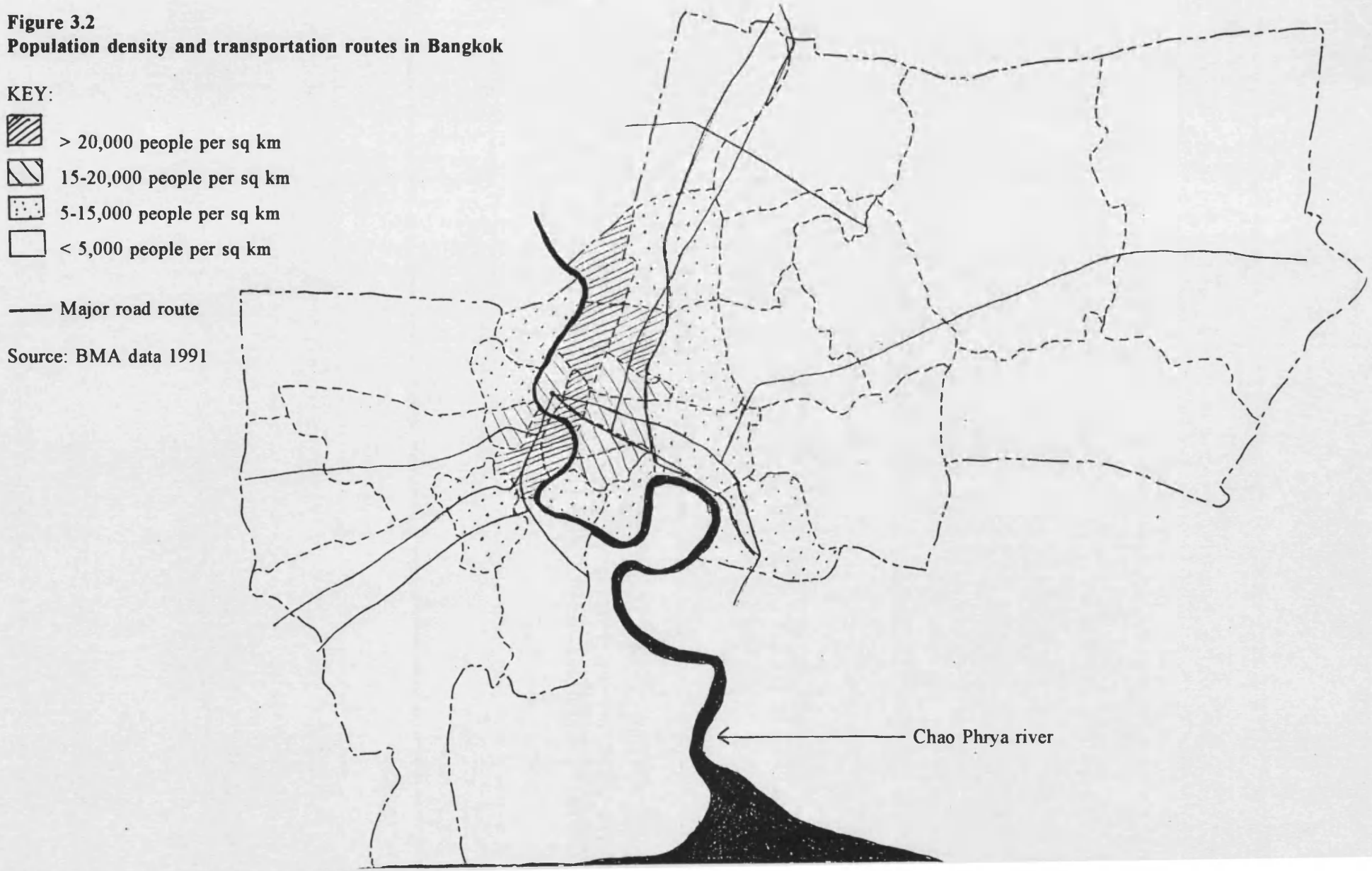
Year	Real GDP Growth (% change)
1980	4.8
1985	3.5
1986	4.9
1987	9.5
1988	13.2
1989	12.0
1990[1]	10.0

Source: Robinson et al 1991

Of the urban population the majority (nearly 60% or 5.9 million people) live in Bangkok (NSO 1993) making the city by far the largest in Thailand. At current growth rates it is estimated that it will be the 14th largest city in the world by the year 2000. Bangkok is a large sprawling city with developments along all the main transportation routes (see figure 3.2). The city has three centres; the old administrative centre around Sanam Luang where many government offices are still located, the business centre along Thanon Silom and Surawong, and the entertainment and tourism centre on Thanon Sukhumvit. The lack of a mass transit system has made travelling in Bangkok extremely difficult; traffic in the city is constantly congested and the average journey time to work is 91 minutes (second only to Rio de Janeiro) (Economist 1995). Residential areas are scattered throughout the city with low density and high density (slum) areas in close proximity (Pornchokchai 1985). The city is also ethnically very mixed, many of the Thais in Bangkok are actually first or second generation Chinese whose families came to Bangkok early this century. In addition many migrant workers from

[1] Preliminary data

Figure 3.2
Population density and transportation routes in Bangkok



Laos and the North East of Thailand spend at least part of the year in Bangkok working in the construction sector and service industries (Keyes 1989).

Besides acting as a catalyst to urbanization, economic growth in Thailand has impacted on the health sector in three principle ways:-

- **Growing inequity**; economic growth has benefitted the better-off disproportionately. The Gini coefficient in Thailand increased from about 0.43 in 1975/76 to 0.48 in 1988/89 (Robinson 1991). Increasing inequity in disposable incomes has generated a widening gap between the standards of health care expected by the rich and the poor. Estimates of occupation specific mortality rates suggest that they are over twice as high amongst agricultural workers as those in administrative or professional positions (Pannurunothai 1992).
- **Changing epidemiological profile**; although infectious and parasitic diseases such as tuberculosis and malaria are still of importance in Thailand, they have been overtaken by injuries and poisonings, cardiovascular diseases and neoplasm as the leading cause of death (Pavabuta 1993).
- **Growth of demand**; income elasticity of demand for health care has been estimated at 1.3 for Asia (Griffin 1991) and 1.62 for Thailand (Myers et al 1985). Rapid income growth, particularly in urban areas has led to increased health care expenditure. It has been estimated that in real terms private household expenditure on health care increased nearly fourfold between 1982 and 1992 (Hsiao 1993). This is particularly astounding as over the same period real government expenditure on health care more than doubled.

Each of the trends identified above has in some respects encouraged the development of the private health care sector. Growing inequity has led the relatively affluent to demand a quality of health care which the public health care sector cannot provide. The high income elasticity of demand for health care means that households are now willing to spend far more on health care than they have in the past. Most of this new ability to pay has been channelled towards private providers. Finally some authors have argued that care for non-communicable and lifestyle-related disease may be better provided through the market place (Birdsall 1989). Certainly such diseases may present less of a social concern than traditional public health problems.

Few other nations, with the exception perhaps of Thailand's neighbours in South-East Asia have been lucky enough to experience private sector growth as a result of economic prosperity. Rather, growth of the private sector has commonly occurred as economies have contracted, government budgets dried up, and the quality of care in the public sector declined. In particular, factors such as drug shortages in the public sector have forced people to seek care from private providers.

3.2.2 Growth of the private health care sector

Historically Thailand has a rich tradition and diversity of health care providers; Okanurak and Chitprarop (1993) identify five main groups of folk healers in Thailand being (i) traditional healers (ii) injectionists (iii) magic doctors (iv) monk doctors and (v) Chinese doctors[2]. However in 1887 King Rama V, a reformer who was impressed by Western scientific progress, established the first hospital of Western medicine in Bangkok, Siriraj, which is still one of the country's premier teaching hospitals. The Chulalongkorn University hospital followed shortly after. In Thailand, unlike countries where a colonial power was in place, these facilities were clearly designed for the use of the local population, however it is unclear the extent to which they were used by common people.

Western medicine in Thailand was principally provided by government and not-for-profit private hospitals, although there were a few private for-profit ones. By the 1970s there were about 24 public hospitals in Bangkok. During the 1970s and 1980s the Ministry of Health focussed its efforts on improving accessibility to Western medicine in rural areas. This it succeeded in doing. By 1987 an estimated 80% of the population were within eight kilometres or one hour's walk of a health centre (MOPH 1992). Neglect of the growing demand for higher quality health care amongst the increasingly affluent urban population was one of the factors which stimulated private sector growth.

The pattern of growth amongst private sector providers is reflected in table 3.2, however a more dramatic picture emerges if Bangkok alone is examined (see figure 3.3). Between 1970 and 1990 the number of private hospitals in Bangkok grew from 11 to 99, and the number of

[2]Golomb (1985) found that the Thais recognized a huge and colourful range of providers including: 'herbalists, spirit-mediums, love magic practitioners, masseurs, bonesetters, diviners, exorcists, sorcerers, injectionists, amulet makers, drug sellers (both Chinese and non-Chinese), eye specialists, skin specialists, morticians, mid-wives, abortionists, snake-bite healers, therapists for insane people, specialists in sinuses, detectors of lost or stolen objects'.

private hospital beds from 765 to 6173. This growth in the private health care sector was supported by increasing private household expenditure on health, between 1982 and 1992 private households' contribution to total health expenditure rose from 63% to 74%.

Table 3.2

Growth in private sector health facilities and manpower in Thailand (1970-1989)

Resources	1970		1978		1986		1989	
	No.	%	No.	%	No.	%	No.	%
Hospitals	93	36.6	186	29.5	264	27.4	354	31.4
Beds	2050	5.4	5842	9.1	8597	10.0	12777	13.7
Doctors	236	6.6	687	11.1	892	9.6	2260	17.8
Nurses	631	8.1	1743	10.6	2014	5.4	4932	8.5

SOURCE: Health Resources Survey, Medical Statistics Division

Private sector hospital growth has been encouraged by incentives provided by the Board of Investment (BOI) (see figure 3.3). Hospitals of fifty beds or more were eligible to apply for Board of Investment support which entailed corporate tax relief and exemptions from import duty for up to 5 years. Hospitals could apply for similar benefits on major expansion projects. It is difficult directly to attribute growth in the number of hospital beds in Bangkok to BOI support, but the two do seem to correspond closely. In 1983 BOI support to the hospital sector was temporarily suspended and there was a corresponding hiatus in hospital construction[3]. Recent negotiations between the MOPH and BOI highlighted the potential over-supply of hospital beds in Bangkok (188 persons per bed in Bangkok compared with 719 persons per bed up-country in 1989 (Nittayaramphong and Tangcharoensathien 1994)) and led to the

[3] Interestingly an analysis of the growth of prostitution in Thailand identifies BOI support to hotels and the subsequent over-supply of hotel beds in Bangkok as being a key factor in the development of sex tourism in Thailand (Truong 1990). BOI support to hotels and hospitals is delivered through the 'Hotels and Hospitals' division of BOI.

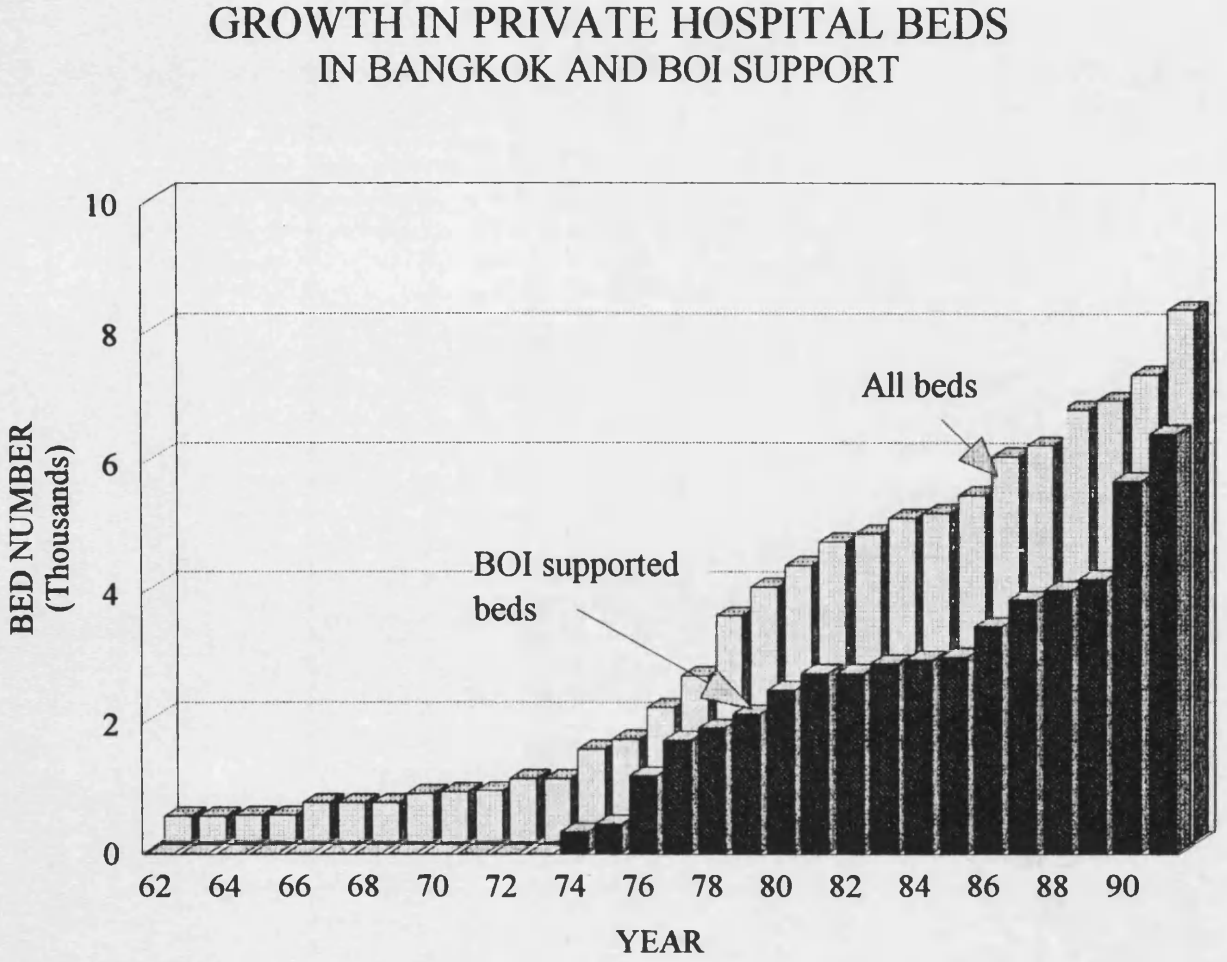

GROWTH IN PRIVATE HOSPITAL BEDS
IN BANGKOK AND BOI SUPPORT
BED NUMBER
(Thousands)
10
8
6
4
2
0
All beds
BOI supported
beds
62
64
66
68
70
72
74
76
78
80
82
84
86
88
90
YEAR

Figure 3.3

cessation of further BOI support to private hospitals in Bangkok.

A further factor which can often stimulate private sector growth is the spread of health insurance coverage thus improving the financial accessibility of private providers. Unfortunately good historical data on health insurance coverage is not available but Table 3.3 compares 1987 data with that for 1992. It can be seen that there is a range of different insurance schemes in operation in Thailand, but during the past five years there has been only a small increase in health insurance coverage. The one important exception to this being the implementation of the Social Security Scheme in 1990.

Table 3.3

Recent expansion of health insurance in Thailand

	1987			1992		
	Population coverage M	%	Exp per capita (Baht)	Population coverage M	%	Exp per capita (Baht)
CSMBS	4.9	9.2	683.2	6.4	11.3	900
Social Security	-	-	-	3.8	6.8	480
Private health insurance	0.2	0.5	1855	0.6	1.1	622
Health Card	2.7	5.1	68	3	5.3	65
Free Care	10	19	214	11.7	20.7	214

SOURCE: Adapted from Tangcharoensathien V (1990) and Hsiao W (1993)

3.2.3 The Structure of the Thai Health Care System

Figure 3.1 is a reasonable reflection of the structure of the health care system in Thailand. The roles of and relationships between the main agents in the system are discussed in this section.

Providers

A plethora of public and private providers exist at both primary and secondary levels. Although there is a reasonably well established referral system within the public sector, particularly in rural areas, referral links between public and private providers, and within the

private sector are far weaker. Some innovative schemes within one province are experimenting with developing referral linkages between private primary providers and secondary government care (Nittayaramphong 1991a). The new social security scheme has helped to develop links between different level providers within the private sector (Siriwarangsun 1994). However in general such referral mechanisms are weak and consumers frequently choose to enter the formal health care system at the hospital level. Therefore hospitals have large outpatient departments dealing with relatively minor conditions.

In addition to private hospitals there are numerous private clinics in Thailand with more than two thousand in Bangkok alone. Many of these clinics are run by government doctors to supplement their public sector salary. In recent years a number of private diagnostic centres have been established. These specialize in high technology tests such as CT scans and MRIs.

Despite the historically rich culture of traditional practice, traditional healers are thought to no longer be a popular source of health care. A 1985 survey indicated that just 1% of urban residents sought care from traditional healers, and in the rural areas the corresponding figure was 2.8% (IPSR 1988). Even allowing for some reluctance to reveal such utilization patterns in a structured interview it would seem that traditional healers are no longer widely used. The new form of horizontal product differentiation which is emerging is that of specialized services. This trend is just starting, but a review of the investment potential in the private health care sector suggested that as the supply of hospital beds increases in Bangkok, hospitals offering more specialized services, such as cardiac centres, will do well (Pianpaktr 1993).

In section 3.1 it was commented that in many parts of the developing world private for-profit providers played an extremely significant role. This is indeed the case in Bangkok as reflected in Table 3.4. Private for-profit providers account for the bulk of hospital ownership in Bangkok with non-profit providers playing a relatively small role. The converse is true in the US.

Table 3.4

Patterns of Hospital Ownership in Bangkok and the US

	Bangkok	US
Government	23%	23%
Private for-profit	66%	12%
Private non-profit	11%	65%

Source: The Economist 1993 and Medical License Division, Ministry of Public Health.

Some of the smaller private for-profit hospitals are owned and run by physician-owners. However the majority of hospitals employ doctors. There are a variety of ways in which such doctors could be remunerated. In Bangkok common practice is for the hospital to collect all patient revenue and then pass on to doctors a percentage of the fee collected from patients they have seen. The precise percentage paid to the physician varies between hospitals and also according to the number of hours per week which the physician works at the hospital. Many larger hospitals have a number of core full time staff who receive, in addition to their share of the patient fee, a salary. Most of the doctors who work part time in the private sector have full time public sector posts. There appears to be little difference between private for-profit and private non-profit hospitals in methods of remunerating doctors[4].

Financers

Figure 3.1 suggested that the main source of finance for public health care providers in developing countries tended to be the government budget, and for private providers, out-of-pocket payment of fees was the most significant source of revenue. In Thailand the situation is only slightly different. Public hospitals and clinics also charge quite significant fees, and the Ministry of Public Health recovers on average 48-51% of total operating costs, principally through fees (Tangcharoensathien et al 1992).

A number of insurance and medical benefit schemes exist but their total population coverage is quite limited, suggesting that out-of-pocket payments are indeed important. Moreover access to private providers under these schemes is often limited. The health card scheme and the free

[4] Information on remuneration policies in hospitals was collected through interviews with hospital directors.

care scheme (which is really a social welfare scheme rather than a health insurance scheme) do not allow any access to private providers. Civil servants seeking private sector care receive only limited reimbursement and private health insurance coverage is very limited. In addition some people may be insured under more than one of the schemes hence simply summing the population covered by each is likely to lead to an over-estimate of population coverage. A more detailed description of each of the main insurance and medical benefit schemes operating in Thailand is given in Appendix 1.

Of the financing arrangements currently in operation the Social Security Scheme is by far the most significant. The Act was passed in 1990 and implemented in 1991 with plans to cover all workers in establishments with 10 employees or more by 1994 and to allow other workers to join voluntarily in 1995. Medical care provided under the scheme is paid for on a capitation basis. There was some concern initially that the low level fee agreed upon (700 Baht per annum, approximately US$28) would deter private providers from participating. However due to limited administrative capacity employers were asked to choose providers on behalf of employees. As a result insured persons often lived a long way from their contracted provider and rarely use their contracted hospital, frequently seeking care elsewhere (Nittayaramphong et al 1991b). This problem is being resolved as employees' are gradually being given the opportunity to choose their registered hospital. In the meantime the scheme has proved very profitable for the private sector and over time there has been a marked shift from public sector registrations to private sector registrations. For example between 1991 and 1992 the percentage of employees registered with private providers swung from 16.4% to 41.7%.

Limited administrative capacity is a problem with virtually all of the schemes mentioned. The Social Security Scheme has clearly the strongest administration; it pays on a capitation basis and has computerized records, though the planned health information system is still not fully functioning. In contrast the large Civil Servants' Medical Benefit Scheme keeps paper records which are only analysed in terms of levels of expenditure and has no record of medical procedures carried out. At the moment none of the financing schemes in Thailand (including private sector insurance companies) act as effective purchasers of health care, exerting discipline in the market. Thai policy makers hope that the Social Security Scheme may develop this capacity in the near future.

Consumers/Patients

Hsiao (1993) describes the Thai health care system as a three tier one; the bottom tier being

free care for the poor, the middle tier consisting of the middle classes who are often covered by some form of insurance, and the top tier being those sufficiently wealthy to pay out of pocket (Hsiao 1993). However in reality there is considerable overlap between these tiers; middle and even lower income people may use private providers and pay out-of-pocket, the very wealthy may well be covered by some form of insurance which they will elect to use when necessary. Little data on utilization by socio-economic group exists in Thailand. In one study in Northern Thailand a positive association was found between income and admission into private sector hospitals, but even in the lowest income quintile 37% of admissions were in the private sector (see table 3.5). It is likely that for primary care there is an even higher rate of private sector utilization amongst the poor as the services are so much cheaper.

Table 3.5

Hospitalization by Household Income Group in a Northern Thai Town

Income Quintile	N	Admission rate	% Admission in each sector	
			Public	Private
1 (lowest)	62	9.9%	59.3	37.0
2	58	8.2%	44.1	50.8
3	67	8.9%	26.7	68.0
4	70	9.2%	16.9	80.3
5 (highest)	84	9.7%	18.6	75.6

Source: Pannurunothai 1993

There have been few studies in Thailand examining attitudes towards and behaviour in seeking health care from the allopathic health care sector.

3.2.4 Implications of Private Sector Growth

Increasing numbers of private hospital beds in Bangkok have clearly brought some benefits to the consumer; access to hospitals has improved and there is greater choice in terms of the

quality and price of care available. It is also possible that the private sector may stimulate more competitive behaviour amongst public hospitals. On the other hand, private sector growth has imposed an indirect cost on government as competition for scarce skilled manpower has increased wages. Virtually all government doctors also carry out private work and often double or triple their income through such employment (Chunharas et al 1990). Such high levels of private sector participation may lead doctors to neglect their public sector responsibilities. Recently the MOPH introduced a B10,000 private practice allowance for doctors who do not engage in any private sector activity. It is too early to tell how successful this will be.

Cost escalation stimulated by private sector competition is also a concern of the authorities (Nittayaramphong and Tangcharoensathien 1994). Private hospitals have been the leaders in acquiring high technology equipment in Thailand. Bangkok in particular is very well supplied compared to cities in industrialized countries. Once high technology equipment has been acquired there is a financial imperative to use it frequently in order to cover costs. It is feared that this has led to supplier-induced demand in Bangkok, although there is no hard evidence to support this claim. The potential problem of induced demand is acknowledged by the population who refer to it as 'liang jai' meaning literally 'to feed an illness'. The media also recognize the problem, for example one newspaper article suggested that fee structures may be partially to be blame for high rates of Caesarian sections in the private sector (up to 60% of births in some private hospitals) (Combe 1992).

Thailand already spends a comparatively high percentage of GNP on health care without reaping the same level of health benefits as that in lower spending countries. MOPH estimates suggest that more than 8% of GDP may be spent on health care by the year 2000 (MOPH 1992).

Finally there is a concern that the rapid rise of private hospitals has led to the commercialization of health care. Anumber of incidences have been reported in the national press where emergency cases have been refused care as they were unable to pay a deposit (Cheang 1992). There are also common complaints that private hospitals charge unreasonably high prices for care. Hospitals make a considerable investment in the advertising of their services, on radio, in newspapers, as well as in huge neon lights outside their facility.

3.3.5 Regulation of Health Care Providers

The two principle means for regulating health care providers in Thailand are:-

i. The 1963 Medical Institutions Act (Government of Thailand 1963)

This applies to the health care institution rather than individuals working within the institution. Key articles in the Act include:-

- Compulsory annual registration with the Medical License Division, MOPH for all private hospitals and clinics in Thailand;
- Definition of certain structural aspects of quality of care (such as adequate toilet facilities, space per bed etc) and provision for enforcement of these standards by the Medical License Division;
- Provision for the MOPH to require private hospitals to give to the Ministry certain medical (as opposed to financial) data;
- Provision for private hospitals to advertise their services so long as they do not 'make false claims in order to induce the patient to go to that facility'.

ii. Professional legislation such as the 1983 Medical Council Rules on Medical Ethics (Medical Council 1983).

These rules apply to individuals rather than institutions. The Medical Council rules cover a variety of ethical questions including the prohibition of payments for onward referrals, provision of unnecessary services for financial gain, refusal to assist patients who are critically ill, working in an unregistered facility etc. The rules are enforced in a passive manner ie. the Medical Councils will deliberate on any complaints which are brought to their attention.

There are a number of problems associated with the enforcement of the regulation described above. For example some of the recent unethical behaviour decried in the press (such as refusing treatment to emergency patients who are unable to pay in advance) has been carried out by hospital managers or administrators. No action can be taken against such behaviour; the Medical Institution Act does not cover any procedural aspects of quality of care regulation and the Medical Council whilst covering ethical behaviour is unable to take action against non-medical administrators (Cheang 1992). It seems that the Medical Institutions Act is outdated. Thirty years ago there were virtually no private for-profit hospitals in Thailand and the regulation described was able to regulate effectively small proprietor-operated clinics. However the growth in numbers of investor-owned hospitals in Thailand, and the consequent separation of medical and management functions, has raised a new set of problems which the

current regulations are inadequate to deal with.

Even though the powers given to the MOPH by the Medical Institutions Act are fairly limited, they are not fully exercised. For example the annual Health Resource Survey carried out by the Health Planning and Statistics Division, MOPH, has a very low response rate (approximately 30% of private hospitals in Bangkok), but no action has ever been taken to enforce hospitals to respond. This can partly be explained by vested interests. As mentioned above virtually all public sector doctors in Thailand also have private sector employment. It is common for more senior officials within the Ministry to have financial interests in private hospitals and clinics. (A recent Minister of Health first set up, and now is the principal shareholder in, one of the largest private hospital businesses in Thailand.) Given such close interlinkages between policy makers and the world of commerce it is unsurprising that more effective regulatory controls have not been effected.

Unlike many other lower and middle income countries Thailand has a rich civil society including many non-government organizations and pressure groups. At the moment such groups are not active on this issue, but the press certainly is. Considerable coverage has been given in the newspapers to questions concerning the ethics of private health care providers, and this may catalyse a more active role on the part of consumer groups. Unfortunately doctors in Thailand have always been viewed as being at the top of the social pyramid and hence there is a natural tendency not to question their actions (Smith 1982). This tendency is reinforced by a cultural abhorrence of personal conflict, particularly with persons seen to be socially superior to oneself.

3.3 SUMMARY

Although developing country governments have often attempted to provide their population with access to public sector health care services, in many countries a large, relatively free market in health care exists with substantial private sector involvement. This is particularly true of urban areas where a willingness and ability to pay for private sector services is concentrated. In very low income countries the private sector is focused at the primary level, but increasingly private sector hospitals and nursing homes are playing an important role. In many developing countries referral mechanisms between primary and secondary levels are weak to non-existent and patients commonly seek care direct from the hospital level. This is particularly true in South and South-east Asia.

A high degree of product heterogeneity exists in the health care sectors of developing countries. Horizontal product differentiation is rooted in people's varying tastes for different types of health care; in the developing world people often appreciate both western and traditional forms of medicine. Vertical product differentiation is rooted in differing ability to pay which in turn is related to inequities in income and wealth. Thus in the private segment of developing country health care markets, certain providers offer very high quality of care whereas others may provide care of an unacceptable standard. Low standards of care in developing countries are only partially driven by the population's limited ability to pay. Anecdotal examples of over-servicing are widespread. Weak regulatory authorities and the large number of for-profit providers probably contribute to this problem.

In most developing countries patients are the main purchasers of health care; insurance and medical benefit schemes are limited in scope. Where schemes do exist they tend to have limited bureaucratic capacity. This has two main implications. Firstly insurance schemes in developing countries are rarely sufficiently large or well organized to exert purchasing power over providers and encourage appropriate behaviour. Secondly because patients commonly pay out-of-pocket they are likely to be more price sensitive than their industrialized country counterparts.

In certain respects the private health care sector in Bangkok is unusual; growth in the sector is principally attributable to rising real incomes and the emergence of a middle class. Despite this, the private health care market in Bangkok shares many features of urban health care markets in other developing countries. It is large, diverse and weakly regulated.

CHAPTER 4
TOWARDS HYPOTHESES

4.0 INTRODUCTION

This chapter explores the principal differences between hospital markets in the US and those in Bangkok. It first provides an overview of possible factors affecting competition, and then focuses in upon key dimensions of the market in Bangkok. Whilst many of the studies of hospital competition described in Chapter 2 focused on testing one particular model of competition, more recent studies have allowed more complex relationships between models. The shortcomings of earlier studies and recent more sophisticated studies are reviewed in section 4.2. Building upon section 4.2, section 4.3 sets out a model describing the possible responses of hospitals to competition, and how these responses are interrelated. This model feeds directly into a consideration of hypotheses and modes of analysis in section 4.4.

4.1 FACTORS AFFECTING COMPETITION

Much of the previous debate described in Chapter 1 has been about the extent to which problems of imperfect information inherent in health care lead to distorted markets. Figure 4.1 emphasizes that although this is clearly an important consideration, there are a number of institutional factors which will vary from country to country and will significantly affect the form of competition. The variable of central interest is the intensity and form of competition. A number of factors are seen to affect it directly including the inherent degree of imperfect information in health care, the predominant payment mechanisms, market concentration, regulation, provider ethics, the degree of consumerism in the market, the extent of product differentiation, search activity and the potential gains to be made from signalling.

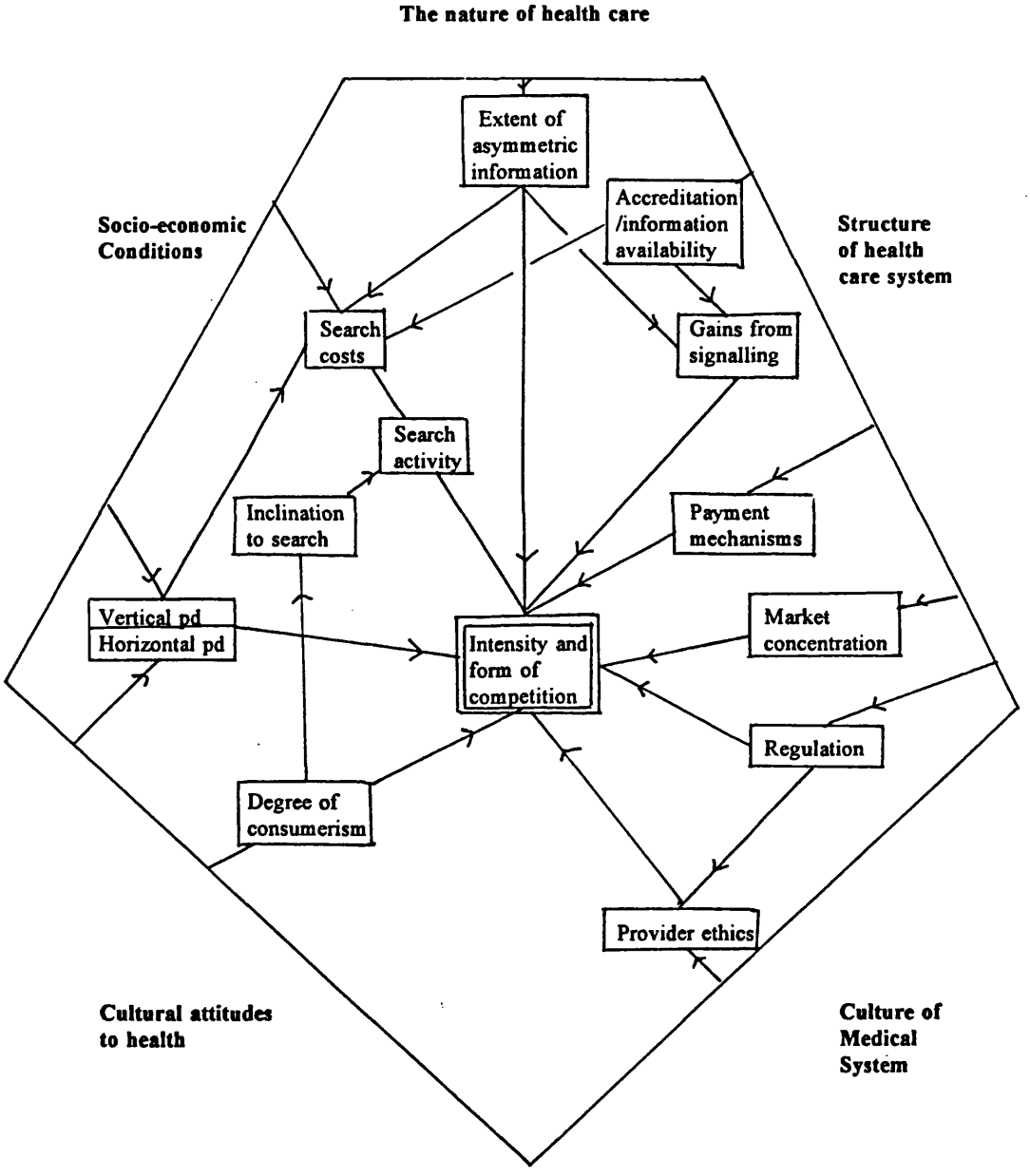
The predominant form of **payment mechanism** in a market defines the incentives which providers face (Glaser 1987), for example a capitation based payment mechanism forces providers to compete on the number of patients which they attract, thus hospitals may attempt to provide pleasant facilities, polite staff etc.

In standard economic theory **market concentration** is seen to be the core element affecting the degree of competition. However this may not necessarily be the case in health care. Firstly **product differentiation** (both vertical and horizontal) is acknowledged to have potentially a direct impact on competition through market segmentation. Secondly if problems of imperfect information are sufficiently acute then price competition may be much weakened or not present at all.

The strength of both **provider ethics** and **regulation** may affect the degree to which providers engage in less acceptable forms of competition. **Consumers** may also help to prevent certain unacceptable forms of provider competition depending on the extent to which they behave in a consumerist manner.

Figure 4.1

Variables affecting the intensity and form of competition in health care



Forceful consumers who question whether care recommended is adequate and/or necessary, or who prosecute if they think they have been poorly treated, may help prevent providers from engaging in inappropriate behaviour.

If there is imperfect information then consumers may attempt to overcome the problems generated by searching for more information. The extent to which consumers will engage in **search activity** will depend partly on the **cost of search**. If information is hard to come by and unreliable when found, then search costs are high, and people will choose to carry out only a limited amount of search. The level of search activity will also be affected by people's general inclination to search. If people do not view health care as a 'consumer good' then they may be happier placing their trust in one provider and avoiding search activity.

Problems arising out of asymmetric information may encourage high quality providers to attempt to **signal information** to consumers, which will affect the nature of health care competition.

4.2 INSTITUTIONAL DIFFERENCES BETWEEN BANGKOK AND US HEALTH CARE MARKETS

This section uses the framework set out above to consider what the key aspects of institutional differences between health care markets in Bangkok and the US are. Whilst Bangkok is not typical of health care markets in developing countries, several health care markets in South East Asia have similar characteristics.

4.2.1 Coverage and strength of health insurance schemes

In Thailand health insurance schemes cover a minority of the population (see Table 3.3). Without health insurance coverage, many of those purchasing health care in Bangkok will pay for care on a fee-for-service basis, out-of-pocket. This form of payment mechanism presents strong incentives to the patient to contain the cost of care ie. demand for care amongst uninsured patients is likely to be more price elastic than demand amongst the insured. However even amongst the insured population in Bangkok there may be a relatively high price-elasticity of demand, as most insurance schemes, with the notable exception of the Social Security Scheme, impose high levels of co-payment on those choosing to seek private sector care.

The form of payment amongst the uninsured population is also important. Fee-for-service

payment creates incentives for the provider to increase service intensity. Where the bulk of the population does not have insurance coverage it is very difficult to shift the predominant form of payment mechanism from fee-for-service to prospective payment. In contrast in the US, much wider insurance coverage provides greater scope for alternative forms of payment mechanism. Although historically fee-for-service was the most common way to pay providers in the US, there is increasing use of prospective forms of payment such as DRGs.

Not only is insurance coverage more limited in Bangkok than it is in the US, but insurance organizations in Bangkok have been relatively weak purchasers. For example under the CSMBS no records are computerized, no form of utilization review or review of summary statistics on service use takes place, and the Scheme does not attempt to negotiate prices with providers. The Social Security Scheme has taken a slightly more active stance in relation to purchasing services: it at least requires that contracted service providers supply the scheme with a minimum data set of patient information, but limited capacity of the Scheme has, up till now, prevented effective use of this information. The average health care consumer in the Bangkok market does not have an effective agent purchasing care for him or her.

In the US, financers of health care have become increasingly active purchasers of care, particularly through preferred provider schemes where insurance schemes will agree to channel patients towards particular providers in return for favourable prices. This shift in behaviour was initiated by public purchasers (Medicare and Medicaid) but has since spread significantly amongst private insurers. California changed state regulation in 1982 to encourage selective contracting amongst insurance plans (Zwanziger et al 1994), and by 1990 more than 80% of insurance beneficiaries were enrolled in a scheme which involved selective contracting. It has been shown that this move towards selective contracting has succeeded in strengthening price competition within the market (Gruber 1994, Hadley et al 1996, Zwanziger et al 1994).

4.2.2 The Provider Market

Product differentiation on the part of providers may serve to weaken the effects of competition by segmenting the market. This effect has been observed in hospital markets in the US (Succi et al 1997, Zwanziger et al 1996).

In Bangkok there is substantial product differentiation, which is probably greater than that observed in industrialized country health care markets. This higher level of product differentiation

is likely to be rooted in the higher degree of income inequity observed in developing countries. Two aspects of product differentiation are particularly noteworthy. First, weak regulation in the Thai context means that for many aspects of care, such as staffing, there are no fixed minimum standards. This creates greater potential for hospitals in Bangkok to 'skimp' on services than is feasible for hospitals in the US. Second, it is commonly suggested, although there is little empirical evidence to support it, that the primary form of product differentiation in the Bangkok market is between public hospitals which offer high clinical aspects of care but with poor waiting time and hotel aspects, and private hospitals which offer good hotel aspects of care but tend to provide poorer clinical quality. This second factor is of particular importance given the very large number of for-profit providers in the hospital market in Bangkok compared to the US.

4.2.3 The internal organization of hospitals

Until recently, a key dimension of competition in the US derived from patterns of physician employment in the market. Most hospitals have a small salaried medical staff but depend primarily upon privately practising physicians choosing to admit their patients. Thus it has been suggested that one of the primary forms of competition between hospitals was to enhance medical amenities in order to attract physicians to the hospital. As physicians are likely to be very insensitive to prices (and patients only price sensitive to a limited degree due to health insurance coverage) hospital price competition was limited.

In Bangkok hospitals tend to have a core staff paid partly salary and partly fee-for-service. In addition they will have other physicians who are employed on a part time basis, and probably work in a public sector facility the rest of the time. Referral mechanisms are extremely weak. It is more likely that a patient will him or herself elect to go directly to a hospital outpatient department than be referred from a first level provider. Even if referral is made from a first level provider there is unlikely to be any formal linkage between primary and secondary level providers, and informal linkages (such as backhanders or 'cut practice') appear not to be widespread in Thailand.

Thus in the Thai model, the principal (ie. the patient) is likely to take full responsibility for choosing a source of hospital care, in contrast to the US situation where at least one of two key agents (an active purchaser and a physician with admitting rights) will play a critical role. In the US the balance between price competition and quality competition will in part relate to the relative strengths of purchaser and physician. Where physicians drive patient choice, little price sensitivity is likely to be observed and the main form of competition is most probably quality

competition. However as insurance organizations have come to dominate patient choice in some states, demand has become more price sensitive and competition has increasingly focussed on price. In Thailand, the preferences and price sensitivity of consumers will be critical in determining the form of competition.

4.3 RECENT ADVANCES IN UNDERSTANDING HOSPITAL COMPETITION

Most of the studies reviewed in section 2.5 were relatively simple: they focused on one particular model of competition (with the notable exception of Frech and Woolley 1993 and Noether 1988), and attempted to test this model by assessing the relationship between one pair of variables. For example the studies of quality competition focused primarily on establishing linkages between higher levels of competition and higher quality dimensions. This rather narrow approach means that the studies ignored or did not consider the simultaneous presence of alternative forms of competition in the market. Many of the studies focusing on quality competition ignored the possibility that price competition may also exist.

A further concern is that the partial approach adopted by the studies may result in misinterpretation of data as more complex explanations of the phenomenon observed are not considered. Feldman and Sloan (1988) have pointed out how the early simple studies establishing correlation between high physician density and high service intensity which were taken as evidence of supplier induced demand may have misinterpreted the data. Such studies ignored the demand side of the equation: easier access to physicians would be predicted to result in greater patient-initiated demand.

During the 1990s, partly as a result of health sector reforms in the US and other OECD countries which stressed a greater role for informed purchasers, analyses of hospital competition have more commonly allowed a role for traditional price competition, combined with other forms of competition. Noether (1988) and Frech and Woolley (1993) were amongst the earlier studies, but several more recent analyses have pushed the ideas further.

Gruber's (1994) primary focus is the effect of selective contracting upon hospitals' delivery of uncompensated care. He hypothesizes that selective contracting has placed hospitals in more competitive markets under financial pressure which will result in a decrease in the amount of uncompensated care they are able to provide. Price shopping by purchasers implies that hospitals face a more elastic demand curve and will be more inclined to reduce prices. However their objective in reducing prices is to increase the quantity of services provided. As revenue is a

function of price and quantity of services sold, the balance of these two effects will determine the degree of financial pressure which a hospital faces. Gruber finds that in more competitive markets hospitals net revenues tend to be less, suggesting that the price effect is greater than the quantity effect and therefore that hospitals in such markets face financial pressure.

Hospitals may respond to declining net revenues by increasing efficiency. Ideally in order to investigate this relationship, mark-up over cost should be examined. Lacking such data on mark-up, Gruber assesses factors affecting net income. The regressions on net income produce similar results to those on net revenue, suggesting that even if costs were reduced this was insufficient to offset the decline in revenues.

Hadley et al (1996) are also interested in the impact of increased financial pressure on the hospital industry. They explore the impact of base period financial position and competition on change in hospital performance. A large number of measures of performance are examined including change in total expenditure, revenues, profitability, prices and efficiency. The researchers are particularly interested in whether hospitals respond to financial pressures by constraining cost growth or by cost shifting (to less aggressive purchasers). The study finds that hospitals in more competitive areas have lower growth in expenditure and revenues, however the impact on revenues is greater, leading to lower growth in profit rates than in less competitive markets. This implies that hospitals facing financial pressure do attempt to contain costs but are unable to do so to such an extent that they fully offset lower revenues from competition. The authors find no evidence that hospitals under financial pressure are able to increase total revenue or prices.

Other studies in the US, whilst using rather less comprehensive approaches have demonstrated the changes which selective contracting has brought about. Zwanziger et al (1994) compared the Californian hospital market in 1980/82 with that in 1990. During the early period the quartile of hospitals in the most competitive markets were 17% more costly and had 14% higher revenues than those in the least competitive quartile. A decade later the cost gap had narrowed to 3% and revenues in less competitive markets were more than those in the highly competitive market. Santerre and Bennett (1992) find that the relationship between higher levels of competition and higher costs only holds for not-for-profit hospitals, where, presumably, a continuing role for prestige in hospital managements' objective functions means that there is a stronger emphasis on enhancing quality. Dranove et al (1992) challenges previous studies which supported the medical arms race theory by demonstrating that failure to measure fully the extent of hospital markets results in a bias which over-states the significance of quality competition.

Studies of the impact of competition in the UK internal market have been somewhat hampered by the newness of the market and by regulatory structures which would appear to dampen scope for price competition. However work by Propper (1994) and Propper et al (1997) indicates that the regulatory structures are not strictly adhered to. Furthermore an examination of extra-contractual referral prices (Propper 1994) and hospital prices to GP fund holders (Propper et al 1997) finds evidence to suggest that in markets with higher levels of competition there tend to be lower prices. The UK studies include variables on teaching status and availability of high tech equipment as proxies for quality. Whilst a hospital's teaching status may allow it to charge higher prices, surprisingly high-tech status is often negatively associated with price. Another interesting result emerging from these studies is that the results differ somewhat for different specialities reflecting structural differences in the UK market for different types of services.

Recent studies of hospital competition have advanced our understanding in a number of respects. First recent reforms in market structures which have generated greater price sensitivity amongst purchasers, appear to have shifted the nature of competition in the US market. Second, recent studies are more likely than earlier studies to allow multiple forms of competition to co-exist. Third, they explicitly acknowledge the complex inter-linkages between different hospital decision variables such as quality, cost, and price, and that if multiple models of competition co-exist then unravelling which forms of competition are present in the market can be very complicated.

4.4 MODEL'S PREDICTIONS ON HOSPITAL RESPONSES TO COMPETITION

Figure 2.1 captured the simple, direct, effects predicted by different models of a decrease in market concentration (ie. an increase in competition). It was observed that even if models operated in their pure form it may be difficult to tell them apart. The variables of interest were:-

- fees/price
- provider income (or revenue)
- quality
- service intensity

Here we consider in a little more detail the interrelationship between these variables and the various competition models.

Economic theory is clear as to how prices are determined under monopolistic or perfect competition. But most health care markets are monopolistically competitive and therefore price cannot be predicted in a straightforward manner. Common practice amongst companies is some form of 'cost plus pricing' which implies that firms set price based upon a measure of average

cost (usually average variable cost) plus some percentage mark-up for profit.

The percentage mark-up adopted may depend on a number of factors most notably the competitive environment. So for a particular service (i), price will equal average cost of that service (Ci) plus a mark-up (μ) which will be a function of the level of competition for that service (COMPi).

$Pi = (1+\mu)Ci$ where $\mu = f(COMPi)$ (1)

The most direct test of price competition, would be whether more competition leads to a lower mark-up. However as mark-up is generally unobservable it is common to look instead at price. However average cost (Ci) will be a function of other decisions made by the hospital such as the level of quality selected (Qi), the scale of production activities (Xi), as well as range of exogenous variables such as factor prices (denoted by Zi).

$Ci = f(Qi, Xi, Zi)$ (2)

According to equations (1) and (2) if both quality and price competition occur in a market then the impact on price is indeterminate. According to the model of price competition: higher competition has a direct effect on mark-up in equation (1) driving price down. But according to the model of quality competition: higher competition will result in higher levels of quality. If average cost is a positive function of quality then higher quality will drive up costs, which will in turn result in higher prices.

Some studies, such as Gruber (1994), have used profitability, or net income as a proxy for mark-up. However it is a rather imperfect measure.

Profit = total revenue - total cost

$PROFITi = PiXi - Ci(Qi, Xi, Zi)\ Xi$ (3)

This can be re-written as the identity: $profit = Xi(Pi-Ci)$ (4)

Which simply states that the total profit[1] made on service (i) will be the mark-up multiplied by the

[1] The product of number of services sold and mark-up over average variable cost gives total gross profit. In order to arrive at net profit, average fixed costs should also be taken into

number of units of service (i) sold. If price competition prevails, mark-up in more competitive environments will be less, placing downward pressure upon profits, but there may be a compensating effect due to the higher number of services provided.

The quantity of a service sold will depend upon the price of that service (Pi), the quality (Qi) and a vector of other variables such as household income, morbidity patterns etc (Yi).

$$Xi = f(Pi, Qi, Yi) \qquad (5)$$

If there is some degree of price sensitivity in the market, higher competition will result in lower prices which will imply higher consumption. The net effect on revenue depends upon the price elasticity of demand. If demand is inelastic (ie less than 1) then a decrease in price will result in lower revenues, however if demand is elastic (ie. greater than 1) then a decrease in price will result in higher revenues.

The demand for health care is often said to be price inelastic, implying that in the face of greater competition hospitals will not manage to maintain revenue levels by lowering prices. However the price elasticity of demand will be specific to different markets and different services. Recall that it was hypothesized that in the Thai market demand would be more price sensitive than in the US due to the low levels of health insurance coverage.

Introducing quality into this picture, further complicates the issue. Equation (3) suggests that quality is positively related to cost and equation (5) suggests that quality is positively related to demand. Thus if quality competition induces higher levels of quality this will raise costs, but also possibly raise demand (depending upon the sensitivity of demand to quality). Again quality competition brings about two competing effects, and the impact on profit depends on which of these two effects is stronger.

Quality is a multi-dimensional attribute. For our purposes it is worth disentangling a number of dimensions including:-

- technology

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account.

- staff quality
- service intensity
- hotel aspects.

Quality responses by hospitals could link to any or all of these dimensions. If the primary response of a hospital to greater competition is to augment service quality by providing higher service intensity, for example through running more diagnostic tests for ante-natal care, then the supplier induced demand model may easily be mistaken for a special case of the quality competition model. The key element to differentiate between quality competition and supplier induced demand would be whether the increased service intensity has been driven by the demand or supply side of the market. It would only be possible to establish this through direct observation of the consultation process, and even if this were possible it would not be straightforward.

Hospitals may also make decisions about levels of investment in different aspects of quality with an eye to differentiating their product from those of competitors and creating niches in the market (Manheim et al 1994). Such market segmentation is a strategy to ameliorate the effects of competition, but again could conceivably be mistaken for quality competition.

By focusing on a particular service (i) the above discussion abstracts from questions of case-mix. One product of investment in quality could be greater capacity to handle more complex cases. This is an alternative form of market segmentation. The possibility of changes in case-mix as a result of hospital reactions to competition need to be taken into account when interpreting findings.

4.5 IMPLICATIONS FOR ANALYSIS AND HYPOTHESES

4.5.1 Hypotheses

Role of product differentiation in the Bangkok market

Institutional features of the Bangkok hospital market allow a high degree of product differentiation. This has at least two types of implications for competition:-

i. Product differentiation may segment the market. For example if private hospitals offer higher quality hotel aspects and promptness, whilst public hospitals offer higher quality in terms of clinical aspects of care but poorer quality hotel aspects, then one would expect to see segmentation of the market according to severity of condition. Private hospitals would be used for less severe conditions and public hospitals for more severe ones.

ii. High levels of product differentiation allow a greater role for monopolistic competition driven by informational asymmetries. The scope for this is likely to be greater in the Bangkok health care market than the US one. This is for a variety of reasons, the most important of which is the fact that unlike the US there are no informed institutional purchasers or agents for consumers. Furthermore in Bangkok institutional mechanisms (such as accreditation) have not emerged to provide consumers with reliable information on hospital quality.

Consumerist behaviour and price sensitivity of consumers

In the hospital market in Bangkok the absence of strong institutional purchasers means that consumers do not have an effective agent working for them, instead consumers themselves are the prime decision makers. In order to understand the competitive pressures upon hospitals in Bangkok it is necessary to understand how consumers choose between alternative providers.

Lack of such an effective purchasing agent may mean that consumers in Bangkok are compelled to be more active and aggressive purchasers than consumers elsewhere ie. we might see a higher degree of consumerist behaviour in Bangkok.

Furthermore many consumers in Bangkok do not have health insurance coverage. Even those who do have health insurance, often incur a substantial proportion of the cost of care, because of high co-payments. One would therefore expect to see greater price sensitivity amongst consumers in Bangkok than elsewhere, and this in turn would be expected to stimulate price competition in the hospital market.

Form of Competition

Lack of an informed institutional purchaser in the hospital market is likely to exacerbate all types of problems related to informational asymmetry and accordingly provides scope for different forms of non-price competition.

However as noted above there are also reasons to think that price competition may simultaneously be present in the market. The limited extent of insurance coverage in Bangkok is likely to create high price sensitivity amongst consumers, who are the main decision makers within the system.

With regard to the other models of competition presented in Chapter 2, there are certainly factors present in the Bangkok context which mean that they may exist. In Bangkok problems in identifying high quality health care providers may be substantial, in particular informational

problems with respect to the characteristics of different facilities are probably more acute than in the US. Under such conditions the signalling of quality through high profile investment in ESWLs, CT scanners and MRIs may become critical. Hence the relevance of the quality competition model may depend partially on why it is assumed to occur. If it is a product of managers unconcerned with profits and consumers unconcerned with prices then it is unlikely to be applicable. If on the other hand it is thought to be primarily a signalling device then it could be extremely relevant.

The widespread use of fee-for-service payment in Bangkok means that in the majority of provider-consumer transactions, there is an incentive to the provider to over-provide services. Weak regulatory controls over providers and weak provider ethics may contribute to a situation where providers are inclined to abuse their informational advantage in order to increase profits.

If consumers in Bangkok are the main agents driving competition in the hospital sector then issues pertaining to the costs to consumers of gathering information on the alternative providers are very pertinent. However the increasing monopoly model, models the cost of seeking information on provider reputation in a very specific way, this leads to the particular result that higher physician density results in higher search costs. A variety of alternative models about how reputations are formed are conceivable, not all of which lead to the result predicted by Pauly and Satterthwaite.

As demonstrated by Propper (1994) it is probable that the form of competition will vary according to the type of condition. For example consumer search may be more effective for elective services where consumers have time to gather information. Also, consumers may exhibit different degrees of price and quality sensitivity according to the type of services. For example, for minor conditions prompt service may be important to consumers, but price differences play only a limited role in their decision making. In contrast, for more serious conditions, clinical quality of care may be very important to the consumer, and consumers may also be very sensitive to price differences as high prices may not be affordable.

4.5.2 Analysis

In order to prove the presence of price competition in a market ideally mark-up should be examined. However in Bangkok lack of data on costs prevents this approach. One alternative is to examine how prices respond to competition, but if there is a possibility that changes in quality have occurred at the same time then the result of such an analysis is likely to be indeterminate. For example if prices were observed to decline in response to competition then this may be price

competition, or simply due to lower costs as providers have started to skimp on services. Conversely higher prices in the face of greater competition do not disprove the presence of price competition: simultaneous quality competition might have increased underlying costs, perhaps resulting in lower mark-ups, but still higher prices. Profits may be a proxy for mark-up, but are undoubtedly an imperfect one as they are influenced not only be output levels but also by changes in efficiency. With cost data and/or reliable data on output it may be possible to unravel some of these effects, but in Bangkok, data were not available on either of these key variables.

The most obvious way to prove the presence of quality competition is to examine directly the impact of competition upon alternative measures of quality (such as technology, hotel aspects, service intensity etc), but there are at least two potential confusions here:-

i. providers may increase service intensity in certain dimensions (eg. number of tests ordered). This may reflect two different types of responses to competition: providers may be improving quality and trying to meet patient need better, or alternatively the services provided may be unrelated to patient need and primarily a mechanism to raise revenue. Thus quality competition and supplier induced demand may be difficult to differentiate.
ii. Providers may increase certain dimensions of quality in response to competition, this could be quality competition but may also be a way to segment the market and create a market niche for the provider. A provider may pursue both these strategies (quality competition and market segmentation) simultaneously.

It is inherently difficult to unravel the impact of alternative forms of competition, particularly when several forms are simultaneously present in the market. In Bangkok these difficulties are amplified by data constraints, notably lack of data on costs, but also lack of reliable data on output. Nonetheless there are certain combinations of results which will be suggestive (although are unlikely to be conclusive) in terms of the forms of competition present in the market. For example, if higher competition was found to be associated with:-

- higher prices
- lower quality
- no change in service intensity
- higher profits (which would be inevitable if there was not a concurrent increase in inefficiency)

Then it would seem likely that neither price competition nor quality competition were present in the market, but rather a perverse form of competition, such as that predicted by the increasing monopoly model. Findings from the study need to be interpreted carefully bearing in mind the range of possible responses which hospitals might make, and which were set out in section 4.4.

CHAPTER 5
OBJECTIVES AND METHODS

5.0 AIM AND HYPOTHESES

The overall aim of the study is to explore the nature of hospital competition in Bangkok, in particular the impact which (i) problems of asymmetric information (ii) product differentiation and (iii) consumer behaviour have upon hospital competition.

Study hypotheses are as follows:-

- According to economic theory product differentiation is likely to exacerbate asymmetric information, in developing country hospital markets a high level of product differentiation prevails;
- Given the institutional features of hospital care markets in developing countries consumers in developing countries (and in Bangkok in particular) will undertake a high level of search activities and consumerist behaviour;
- The presence of asymmetric information in the market place creates provider market power and means that straightforward price competition is unlikely to dominate, price competition may be present in the market but quality competition and/or supplier induced demand will also exist.

5.1 RESEARCH OBJECTIVES

With the ultimate aim of testing the hypotheses set out above a series of specific research objectives were formulated.

On the issue of asymmetric information and product differentiation the objectives are:

i. To chart the different characteristics of hospitals in Bangkok;

ii. To investigate the nature of product differentiation amongst hospitals in Bangkok; specifically to establish whether (a) hospitals have high levels of certain characteristics and low levels of others (horizontal product differentiation) and/or (b) hospitals tend to have high levels of all characteristics or low levels of all characteristics (vertical product differentiation);

iii. To identify those hospital characteristics which consumers value most and how this varies between different reasons for seeking health care.

On the issue of consumerist behaviour and search activity the objectives are:

iv. To assess how well informed consumers in Bangkok are about the hospital market and in particular the prices and characteristics of different providers;

v. To describe the type of search behaviour people engage in, in the selection of a health care provider in Bangkok;

vi. To assess how 'consumerist' people in Bangkok are with respect to the health care market and in particular to investigate their information seeking behaviour and willingness to question the judgement of health staff;

vii. To investigate how consumers' knowledge about the health care market affects their utilization pattern.

On the issue of the form of competition prevailing in the market the objectives are:

viii. To assess how simple measures of market concentration affect (a) prices (b) quality of care (c) profitability and (d) service intensity;

ix. To describe the nature of competition between health care providers, in particular the extent of price competition vis a vis quality competition and supplier induced demand;

x. If quality competition is evident in the market then to establish the characteristics upon which quality competition is based.

5.2 SUMMARY OF METHODS

The first set of objectives (i-iii) is concerned with describing and analysing the extent and form of product differentiation in the hospital market in Bangkok. In order to do this Lancaster's notion of characteristics was employed. The principle characteristics embedded in hospital services were identified. Then through a survey of private hospitals these characteristics were charted across hospitals. The question of which characteristics consumers' value (objective iii) is closely related to the nature of quality competition (if quality competition exists). Hedonic pricing techniques were used to approach this issue. However, as noted in Chapter 2 there are problems with this method and hence it was supplemented by a consumer survey investigating the characteristics sought in a health care provider.

The next set of objectives (iv-vii) is concerned primarily with the nature of search activity and the extent of consumerist behaviour. These questions were also approached through the consumer survey.

The final objectives (viii-x) concerning the form of competition prevailing in the market were most complex to address. By including in the hospital database variables reflecting the degree of market concentration for each hospital's market area it was possible to examine the effect which market concentration has upon price, quality, profitability and intensity of care in a cross-sectional manner. Using this information and the predictions of each model of competition (as represented in Table 2.1) the prevailing form of competition was explored. In addition to this direct approach to exploring the form of competition, indirect evidence gathered from consumer interviews and observations of the institutional forms in the market were used to supplement findings.

The following three chapters address in turn each of the sets of objectives. Chapter 6 pursues the first set of objectives on hospital characteristics and product differentiation, Chapter 7 examines consumer knowledge and behaviour in Bangkok, and Chapter 8 focuses on the form of hospital competition. The remaining part of this chapter describes in more detail the methods used to collect, process and analyse data. Section 5.3 is concerned with the database on hospital characteristics. Section 5.4 discusses the consumer survey.

5.3 HOSPITAL DATABASE

The first step in developing the database was to decide which hospital characteristics were to be included; all variables are listed in Table 5.1. Consumers were explicitly questioned about the characteristics of health care which they valued in the consumer survey and in addition a literature review was undertaken to establish which characteristics of health care anthropologists and writers from other disciplines had identified. From both these sources it was clear that a number of different facets of health care were considered important. Anthropologists and public health specialists particularly noted the non-clinical aspects of health care such as reassurance and the provision of information, comforting (both in the physical and mental sense), and caring (Ben Sira 1990, Evans and Stoddart 1990, Kleinman 1980, McKeown 1986). But for characteristics such as reassurance and the provision of information, it is extremely difficult to find objective data which can be included in the database. Consumers interviewed tended to be more prosaic identifying factors such as the skills of doctors although they also mentioned factors such as doctors' willingness to provide information.

Variables (1)-(8) in table 5.1 were selected so as to at least partially reflect some of the characteristics described. For example hotel features help to measure the physical aspects of

comfort, a low bed to nurse ratio may imply a high standard of clinical care, a low bed to physician ratio may imply that physicians have more time to spend explaining treatments to or reassuring their patients.

The second set of variables in the table (variables 9-14) are concerned more with the question of competition. The various models of hospital competition examined indicated that changes in market concentration may affect price, quality, profitability and service intensity (variables 9-12). To examine the impact of market concentration on quality some of the hospital characteristics were used in the analysis as well as the financial indicators of quality. Variables 13 and 14 are essentially explanatory variables. In addition to exploring the impact of market concentration on hospital behaviour the study also examined the impact of different types of private hospital ownership.

Table 5.1
Variables for Hospital Database

VARIABLE	NAME	STRUCTURE	SOURCE
1. Bed number	BED_NO	Total number of beds	MLD, Hospital survey
2. Specialization	SPEC	None Some eg. maternity, paediatrics.	MLD
3. Equipment indicator	SUMEQUIP	Total number of the following items of equipment possessed by hospital: - ESWL - CAT Scanner - MRI Scanner	Hospital survey checked against Health Planning Division data from equipment suppliers.
4. Physician inputs	BEDWDR PERCSPEC PERCFTMD	i. Number of beds per full time equivalent MD ii. Percentage of specialists over total MDs iii. Percentage of hours contributed by full time MDs	Hospital survey.
5. Nursing care	BEDWNUR PERCAID	i. Number of beds per FTE qualified nurse staff ii. Number of FTE nurse aides as % of total FTE qualified nurses and nurse aides.	Hospital survey
6. Hotel features	PERCPRI	Percentage private beds out of total beds	Hospital survey
7. Age/ reputation	AGE	Number of years for which the facility has been established	MLD records
8. Distance	DISTANCE	Number of kilometres from city centre	address from MLD plus telephone enquiry then mapped

VARIABLE	NAME	STRUCTURE	SOURCE
9. Financial indicators of quality	ASSPBED EXPPBED	i. Assets per bed ii. Expenditure per bed	Hospital accounts presented to Ministry of Commerce
10. Prices	IP_INDEX ROOM NORMDEL	i. price indicator for inpatient care ii. mean daily charge for room and board iii. price per normal delivery	Survey of insurance records. Hospital survey.
11. Profitability	ASSRETUR PROFMARG	i. profits divided by total capital ii. profits divided by total revenue The accounting measure of profits was used.	Hospital accounts presented to Ministry of Commerce
12. Service Intensity	STANDINV ALLINV LOS ADRATE	i. percentage of total bill going on standard (eg. lab tests, X-ray) medical investigations ii. percentage of total bill going on any investigation including standard and special (eg CT, Ultrasound) iii. Mean length of stay iv. Admission rate	Survey of insurance records. Hospital census
13. Hospital ownership	NFP SET	Not-for-profit/for-profit Stock exchange owned, private company owned	MLD Health Statistics Division.
14. Competition indicator	COMP2/5 BEDCOMP2/5 HHI2/5	i. Number of hospitals within (a) a 2 km and (b) a 5 km radius of the hospital under consideration ii. Percentage of all beds in market (2km and 5km radii) owned by hospital under consideration iii. Herfindahl index based upon the number of beds for (a) a 2 km market area and (b) a 5 km market area	From mapping

Abbreviations: MLD - Medical Licence Division
FTE - full time equivalent

5.3.1 Data Collection

One of the greatest problems associated with researching private hospitals is that it is often difficult to gain their support and collaboration. Particularly sensitive is information on pricing and the financial aspects of care. The study tried to circumvent the problem by using secondary data sources as far as possible and cross-checking these where feasible. In particular heavy use was made of records kept by insurance organizations on the types and prices of care provided by private hospitals, and to a lesser degree of company accounts. Questions concerning staffing, specialization and equipment are less sensitive and were approached through a survey of private hospitals. However these variables were still cross-checked against other data sources where possible.

The two main existing data sources within the MOPH were (i) the routine registration records of the Medical Licence Division (MLD), Ministry of Public Health and (ii) the Health Resources Survey carried out by the Health Statistics Division, Ministry of Public Health. Unfortunately both of these data sources were problematic. The 1961 Medical Premises Act stipulates that all private hospitals and clinics in Thailand must register on an annual basis with the Medical License Division of the MOPH, however the information requested at registration is very limited covering only (i) bed number (ii) specialization and (iii) address. It is also possible to calculate from the MLD records the number of years for which a facility has been established. The great advantage of the MLD database is that it is comprehensive and therefore provides an excellent frame for survey work.

Based on this frame the Health Statistics Division carry out an annual mailed survey of all hospitals, requesting information on staffing, bed numbers and throughput figures. Unfortunately follow up on the survey form is poor and the response rate is very low (approximately 30% in Bangkok). Those forms which are returned are often incomplete. Throughput figures in particular are not felt to be reliable. Although the MOPH has the legal authority to require that hospitals report basic (non-financial) data, it has never sought legal recourse to enforce compliance.

Because of the problems associated with the existing data sources it was decided to carry out a special survey of the 105 private hospitals in Bangkok. This is described in more detail below. In addition a special survey of insurance records was conducted in order to get accurate information on the sensitive question of prices. This is also described below. First however the construction of and data collection for the variables in the database (listed in

Table 5.1) is reviewed. All data collected relate to the calendar year 1992, except profitability data which relate to the financial year 1992/93.

Hospital specialization and the **number of beds** are normally stated on the MLD registration form. This study was concerned primarily with general hospitals and thus for most of the analysis, specialist hospitals are excluded. Unfortunately it was not possible to identify from MLD records, general hospitals with an extra specialist facility[1] this information may have been useful in explaining pricing and utilization patterns.

Data for the variables on **equipment, medical staff, nursing care** and **hotel features** were sought primarily though the survey of private hospitals in Bangkok (described below). In addition information on hospital equipment was available from the Health Planning Division and this was used to cross-check the private hospital survey.

As discussed in earlier chapters the way in which **reputation** is formed remains a mystery, and there is no obvious indicator to reflect reputation. As a tentative suggestion the number of years for which a facility has been established was used as a proxy for reputation although this obviously has shortcomings.

In order to measure the **distance** of a hospital from the city centre, the physical location of all hospitals in Bangkok were identified on a 1:50,000 scale map using the MLD records as a frame. If it was unclear from the physical address quite where the hospital was located then a telephone enquiry was made to clarify the location. Hua Lamphong railway station[2] was considered to be the city centre and the number of kilometres from the railway station to each hospital was computed.

Two further indicators of quality were taken from the company accounts. These **financial indicators of quality** measure the level of inputs per bed.

[1]For example Bangkok Hospital, which is a general hospital, has recently established a specialist Heart Institute.

[2] Hua Lamphong lies approximately equidistant between the old city centre near Sanam Luang, the modern business centre around Silom and the shopping/tourist centre around Thanon Sukhumvit.

Establishing prices for medical care is not a straightforward task. There are two main approaches. The first is to examine individual fees for each component of treatment, for example the fee for an X-ray, fee for a particular surgical intervention, fee for a private room per night etc. This is a relatively straightforward approach but suffers from the fact that different hospitals are likely to combine charges in a different manner. For example, Davis (1972) suggests that the price of some services such as room fees may have a greater effect upon utilization than other fees and thus some hospitals may under-charge for the room and charge more for various ancillary services. Thus a more aggregate measure of price is desirable. Price per inpatient stay or per course of treatment would seem a suitable measure, but it is meaningless unless case-mix is controlled for. Ideally one would also wish to control for severity and procedures.

Because of the problems associated with the fee per item measure, the focus in this study is price per hospitalization. Using the prices found at different hospitals for a specific diagnosis an inpatient price index was computed. Thus case-mix was controlled for but not severity or procedures. One problem with an inpatient price index is that it assumes that hospitals price inpatient care in a standard manner and do not differentiate between diagnoses. For example a hospital with a specialist heart institute may place a higher mark-up on cardio-vascular services. Thus diagnosis-specific prices were also considered. In addition an examination of room fees per night was made to see to what extent hospitals' room charges really reflect the total cost of treatment at a particular facility.

A further problem with the estimation of relative hospital prices is that of access to data. The level of fees charged is a sensitive issue and most private hospitals in Bangkok would be unlikely to reveal this information to researchers. This study used the records kept by insurance schemes to estimate diagnosis specific prices for an inpatient course of treatment. Three different insurance schemes were examined, all of which were publicly organized but would contribute towards the costs of health care sought in either public or private hospitals. Using insurance schemes to collect price data raises the question of whether hospitals charge insured and uninsured patients the same fee. For each of the specific insurance funds studied, patients first pay for care sought in the private sector out-of-pocket and later reclaim expenses from the insurance fund. For these cases the hospital is unlikely to know whether the patient is insured and therefore should not be able to price differentiate. Problems of moral hazard on the consumer side are likely to be constrained by the high levels of co-payment, especially as most schemes reimburse a lump sum amount above which patients pay the full cost of care.

The study of insurance records is described in more detail below.

Profitability data were retrieved from the Department of Commerce. All registered companies in Thailand must submit annual accounts to the Department of Commerce including data on capital assets, income, expenditures and profits. Unfortunately these records are kept by company name which is not always the same as hospital name. However it was often possible to find out the company names of hospitals from the invoices which they issued. The reliability of accounting data in Thailand has previously been questioned and thus the validity of the accounts was crossed checked against alternative sources of information (Pianpaktr 1993) and discussed with informants.

The best way to explore **service intensity** would be through a detailed review of medical records, examining, for example, rates of surgery, the number of investigations given or drugs prescribed for certain well defined diagnoses. Unfortunately accessing such medical records was not possible. Instead two types of indicator were used. First insurance fund records were used to compute the percentage of the total medical bill going on investigations. The rationale for this is that if health care providers wish to 'pad' the bill for care then extra investigations are a very obvious way of doing this. Second throughput data from the hospital census were used to compute mean length of stay by hospital and admission rates. Unfortunately these indicators could not be computed whilst controlling for case-mix and thus they are likely to pick up effects other than service intensity alone.

Information on hospital **ownership** was relatively straightforward to collect from existing MLD and Health Resource Survey records.

Competition indicators commonly take the form of concentration indices (such as the Herfindahl index) which measure the share of the market that different providers within the market have. In Bangkok there are two main problems associated with the use of concentration indices. First, data on private hospital throughput are thought to be unreliable. Second, they entail the definition of market area which is far from straightforward (Robinson et al 1991) and requires detailed information on patient flow which is not available in Bangkok. An alternative measure which some studies in the US have adopted is a simple count of the number of hospitals within a certain radius of the hospital under consideration (Robinson and Luft 1985). Such an indicator has the advantage of simplicity and sufficient data are available to compute it. The only problem is that it is unclear quite how far people

will travel for health care and hence what is the appropriate radius to consider.

The study used three different types of competition indicators. For all indicators a simple measure of market area based on a fixed radius from the hospital was used. The radius was varied between 2 and 5 kilometres reflecting both what hospital directors said about market area and responses to the consumer survey. Two of the measures (COMP2 and COMP5) used a simple count of the number of other hospitals within this radius. BEDCOMP2 and BEDCOMP5 measured the share in percentage terms that a particular hospital had of all hospital beds in the market area. HHI2 and HHI5 constructed Hirschman-Herfindahl indices based on the number of beds. The HHI index is simply the sum of the squared shares of each hospital in the market ie. HHI = $\sum s_i^2$ where s_i is the share of hospital (i) of all hospital beds.

Special Study No 1 - The Private Hospital Survey

The survey was carried out between September and December 1993 in collaboration with the Medical Licence Division, the Health Planning Division and the Health Statistics Division, Ministry of Public Health, Thailand.

An English translation of the survey form used is contained in Appendix 2. The form is quite similar to that normally sent out by the Health Resource Survey: information was requested on staffing (total and by specialists), beds (including special beds such as ICU, delivery), throughput and preventive care provided. A section on number of beds per ward and number of single rooms was added to capture the hotel aspects of care. Hospitals were also asked about the standard prices charged for different types of rooms. The survey questions were designed to be neither too difficult nor too sensitive so that hospital administrators would not be deterred from responding. The survey form was circulated for comment to fifteen senior Thai policy makers in the MOPH and University professors before being finalized.

One of the problems raised by virtually every expert was that of defining full time and part time employees, and indeed whether this was an appropriate distinction to make. The questionnaire requested that all those employees working a minimum of forty hours a week be classified as full time. However a previous survey (Chunharas et al 1990) showed considerable variation in the number of hours worked by public sector doctors outside of their main jobs. It is possible that some public sector doctors work more than forty hours a week in a private hospital (and thus would in theory be counted as holding two full time jobs according to this definition). Secondly some private hospitals have consultants whom they

call upon to assist with particularly difficult cases. Such consultants may work quite irregularly at a private hospital, but potentially could add significantly to its reputation. However as no better basis for distinguishing between part time and full time employees was found, the original definition was kept.

The survey form was piloted at two non-profit hospitals in Bangkok in September 1993, primarily to check that the questions were clear to hospital administrators and that most of the data were readily available. Survey forms were then sent out with a covering letter from the Permanent Secretary MOPH. Private hospitals were asked to complete the forms and bring them with them when they came for their annual re-registration. It was agreed with the Medical Licence Division that no new licences were to be granted without a completed form being presented. Unfortunately this strategy failed. The principal contact person for the study in the Medical Licence Division was taken ill during the crucial re-registration period and without her presence the clerks did not feel able to deny registration to hospitals even if they had not completed the form.

As the information requested in the survey questionnaire was largely numerical only limited coding needed to be carried out. The responses were entered into a DBase III programme and validity, structural and logical checks made. The file was later joined with another file containing other variables included in the hospital database such as distance, price etc.

Special Study No 2 - Survey of Insurance Records

Fieldwork for this phase of the research was carried out in Thailand during the first six months of 1992. In relation to this study the main objective was to collect data on prices and service intensity, however other aspects of the survey have been reported separately (Bennett and Tangcharoensathien 1994). The three main insurance schemes studied were the Civil Servants' Medical Benefit Scheme (CSMBS), and the Emergency and Maternity Funds under the Social Security Scheme. Most of the data used here came from the CSMBS.

Cases were selected from the Bangkok area alone. Table 5.2 summarizes the sampling procedures and number of cases selected. Records for the Maternity and Emergency funds were kept in such a manner that it was impossible in advance to distinguish between cases using public and private sector facilities. These samples were therefore drawn across both sectors although this study uses only the private sector price data. The fourth column of the table shows what percentage of the sampled cases used private sector care. Emergency and

Maternity fund records are kept at the Social Security Office. Records for CSMBS cases using private sector care are retained at the government department where the civil servant is employed.

Table 5.2
Samples taken from Insurance Funds

FUND	SAMPLING	SAMPLE SIZE	% PRIVATE SECTOR	TOTAL POPUL ATION
EMERGENCY	Census	952	49.9%	952
MATERNITY	Simple systematic sampling	1,578	22.4%	2,000 approx
CSMBS	Systematic sampling from 16 purposively selected government departments	3,567	100.0%	unknown

None of the records kept by the various schemes are computerized. Therefore data collection was based upon:-

i. Supporting documents presented by the claimant such as invoices from private hospitals giving diagnosis, total charge and a break down of charges;

ii. The transcript of the interview between the clerk and the claimant, although unnecessary for the CSMBS, for the other schemes this interview provided supporting information which frequently helped clarify the records.

The information contained in each claim was transcribed by a team of students onto specially designed data sheets. An English translation of the data sheet used for the CSMBS is included in Appendix 3. These data sheets were later coded. Coding was a relatively straightforward process apart from the medical diagnosis which had to be translated from Thai to English, and then coded in the International Classification of Diseases coding system version 9. These coded data sheets were later double entry input into a database set up by the researcher. The two databases were then cross-checked for input errors.

This method of collecting data on prices worked well. Access to the health insurance funds was facilitated by the MOPH and the data were collected relatively rapidly. One problem encountered was the limited information given on medical diagnosis, this was due to the fact

that hospital invoices are generally completed by hospital administrators rather than medical officers. Almost all diagnoses could be specified to three figures in ICD 9, but often it was not possible to code to a fourth digit. This shortcoming prevents the development of any more sophisticated measure of relative prices between hospitals based upon diagnostic related groups (DRGs) or other resource based disease categorizations.

5.3.2 Analysis of Hospital Database

Once data had been collected for the hospital database, there were two main steps to be undertaken. Firstly the transformation of the basic data collected into the required indices shown in Table 5.1, and secondly analysis of these indices so as to address the objectives set out in section 5.2.

The most complex of these tasks was the computation of a price index for inpatient care. Basically the method used computed the average price for a range of inpatient services provided by the hospitals and then for each diagnosis, estimated the ratio of the average price charged by a particular hospital to the average price charged for treatment of that condition in the sample as a whole. The overall price index for each hospital was then simply the mean of the estimated ratios.

A number of common diagnoses were used to compile these indicators. For inpatient services the diagnoses used were:- diarrhoea, normal delivery, diabetes, bronchitis, pneumonia, acute appendicitis, dizziness, cerebral thrombosis, peptic ulcer, and gastritis. The criteria for selecting these diagnoses were twofold:-

i. a good spread of cases across hospitals was desirable so that a large number of hospitals could be included in the analysis;
ii. there should be little variation in the treatment given for a particular diagnosis so that the services being priced were comparable.

The second criterion was occasionally overruled by the first. A number of the diagnoses included were not highly specific and thus there may be variation in treatment, reflected by a large standard deviation in charge. On the whole the most common diagnoses were taken except for specialised treatments such as cataract operations which tended to take place mainly in eye hospitals.

The distribution of charges for each of the diagnoses was positively skewed with a few cases

incurring very high charges. In compiling a price index therefore the mean, median and trimmed mean were considered for each hospital and diagnosis. The method for compiling the price index is described below using Figure 5.1.

Figure 5.1
Matrix for computing Price Indices

	D_1	D_2	D_3	D_4	D_5	D_6	$D_{..}$	...	...	...	D_X
H_1	p_{11}										
H_2		p_{22}									
H_3											
.											
.					p_{nx}						
.											
.											
H_N											P_{NX}

Let D_1 ...D_X be the set of diagnoses in the basket.

Let H_1....H_N be the set of hospitals under study.

p_{11}.....p_{NX} are the average prices charged for a diagnosis (D_x) at a particular hospital (H_n). Three different matrices were set up one representing the mean, one the median and one the trimmed mean.

For a particular hospital H_n and a particular diagnosis D_x :-

$$r_{nx} = p_{nx}/(\Sigma p_{nx}/N)$$

That is the ratio of a particular diagnosis at a hospital to the mean price of that diagnosis in all hospitals was computed. From this an overall price index for each hospital was calculated where:-

$$R_n = \Sigma r_{nx}/X$$

Thus the average value of the price index at private hospitals is equal to 100. Not all hospitals had cases under each of the ten diagnostic categories. So long as a hospital had a minimum of four diagnostic categories filled it was included in the final analysis. Although the price index was computed using mean, median and trimmed mean it was quickly apparent that the median was not an appropriate measure as there was often few cases observed and hence the median did not reliably measure the central point of the distribution. Thus the trimmed mean was used in the final analysis. The matrix and computations showing the construction of the price index for the trimmed mean price is shown in Appendix 4.

The other main complication in converting the collected data into indices was the computation of full-time equivalents. Data from the only existing Thai survey of physician's working practices suggests that a typical public sector doctor works an extra ten to fourteen hours per week in the private sector. No similar data exists for nursing staff. Initially part time staff were said to be equivalent to one quarter of a full time employee, but given the uncertainty surrounding this figure, it was subjected to sensitivity analysis.

In order to explore product differentiation within the hospital market the first technique used was simple correlation analysis to test the extent to which high levels of all characteristics went together. In addition multivariate techniques, such as cluster analysis were used to see whether distinct groups of hospitals with similar sets of characteristics existed within the market.

Identification of the characteristics of hospitals which consumers value was based partly upon hedonic price analysis. In Chapter 4 it was suggested that consumers value the services which flow from hospitals, however these services such as healing, comfort, information etc are difficult to measure in their own right. Instead, following Stanley and Tschirhart (1991), we regress price on the underlying characteristics from which these services flow ie $P_{ih}(Z_{ih})$.

The final set of objectives aimed at assessing the impact of market concentration on price, quality of care, profitability and service intensity. For certain variables such as service intensity and profitability this was relatively straightforward and the relationship between them and the competition indicator could be explored through correlation analysis. However the relationship between concentration, prices and quality is rather more complex. It was thought

to be of little value to examine simply the relationship between higher prices and competition as higher prices may reflect higher quality. Instead the previous stage of the analysis (ie the hedonic price analysis) was used to compute quality adjusted prices ie. the predicted price given the characteristics of a hospital, and the difference between the actual and the predicted quality adjusted price was then computed. If higher prices in the market are simply a reflection of higher quality then we would expect the difference between actual and quality adjusted prices to be small. If however there was an alternative form of competition in the market such as supplier induced demand then the difference would be larger and one would expect to observe a pattern in the residuals. Regression analysis was used to explore the variables affecting the difference between actual and quality adjusted prices.

5.4 SURVEY OF CONSUMER KNOWLEDGE, PERCEPTIONS AND HEALTH CARE SEEKING BEHAVIOUR

The objectives relating to consumerist knowledge, perceptions and health care seeking behaviour were pursued through a structured survey questionnaire[4]. Such questionnaires have been widely used by other studies of consumerism, however they are not ideal. In particular a structured questionnaire pre-defines the dimensions along which users evaluate health services rather than allowing users to define these dimensions themselves (Calnan 1988). In order to ensure that the questionnaire closely reflected the way in which respondents thought about health care services it was piloted on four different groups of respondents in two sequential rounds. Moreover during the pilot testing, open discussions were held with respondents about the topics raised in the questionnaire and the adequacy of the defined responses. During this period the questionnaire was changed substantially in order to reflect better the respondents' ideas. The quantitative method adopted here would be well supplemented by qualitative methods such as focus group discussions and in-depth interviews. However as the researcher was not fluent in Thai it would have been difficult both to ensure the quality of such research and to analyse responses.

5.4.1 The survey instrument

Section 1 of the survey form sought to establish what are the desirable characteristics of health care providers under varying conditions. The first three questions asked consumers about characteristics valued in a hypothetical situation. The next set of questions were quite similar but specifically asked which hospital the respondent would go to in each of the described

[4] Appendix 5 contains an English version of the survey form.

situations and why. Thus the second set of questions gave a clearer idea of actual priorities in decision making and also helped to validate the first set of responses.

Section 2 explored consumers' knowledge about fifteen pre-selected hospitals in Bangkok. By asking consumers about a limited list of facilities it was hoped to establish the true prevailing level of knowledge about providers in the market. If an open-ended question, for example 'What is the most expensive hospital in Bangkok?' was asked then the response may or may not be correct, but it would be extremely difficult to establish the respondent's frame of reference; how many hospitals have they compared with this one? Secondly a closed list of hospitals facilitated the verification of responses given.

Basic details about the fifteen selected hospitals are given in Table 5.3. The hospitals were selected to represent a range of size, ownership and price. The majority of the hospitals are centrally located, as it was felt unlikely that respondents would be familiar with hospitals in the suburbs, except in the area where they live.
Section 3 was designed to explore the extent to which people in Bangkok behave in a consumerist manner in the health care sector: specifically it investigated (i) to what extent people's preferences over health care providers are influenced by advertising (ii) whether people engage in search activities in order to improve the information they have available and if so what type of activities (eg. asking friends for advice or asking to see price lists) and (iii) whether people are willing to change provider if dissatisfied with the quality or price of care provided, or do they prefer to place 'trust' in one provider?

This section also asked for information about which hospitals people have been particularly dissatisfied with and their perception of differences between public and private hospitals.

Section 4 asked the respondent for some basic personal data so that responses to other parts of the form could be put in context.

Table 5.3
Selected characteristics of hospitals included in consumer survey form

Hospital	Bed No.	Owner	Central	Inpatient price index
1. Bamroongrad	256	Stock Exch	Y	290.52
2. Samitivej	200	Stock Exch	N	210.44
3. Phyathai	350	Private	Y	147.90
4. Thonburi	435	private	Y	29.06
5. Kluay Namthai	150	private	N	106.18
6. Krungthon	130	Stock Exch	Y	107.42
7. Ramkamhaeng	315	Stock Exch	N	94.91
8. Camillian	100	Not-for-profit	N	82.96
9. Bangkok Christian	320	Not-for-profit	Y	69.32
10. Huachiew	750	Not-for-profit	Y	46.32
11. Chulalongkorn	1213	Govt (university)	Y	
12. Ramathibodi	794	(Govt (university	Y	
13. Central/Klang	458	Govt (BMA)	Y	
14. Rajavithi	900	Govt (BMA)	Y	
15. Phra Mong Kut	1200	Govt (Military)	Y	

NOTES:
1. Those hospitals indicated as being central, lie within a 6km radius of Hualamphong railway station.
2. Public hospitals have not been integrated into the price index. Services at BMA hospitals are provided free of charge. Services at the university hospitals are charged for but are likely to be cheaper than most private hospitals.
3. The military hospitals Phra Mong Kut also serves the civilian population.

5.4.2 Sampling

Different ways of implementing the survey were considered including a telephone survey, an exit poll at hospitals and a survey at place of work. Household surveys were dismissed as being too expensive. There has been little experience with telephone surveys in Thailand and given the complex nature of some questions it was decided that it may be difficult to implement over the telephone. Interviewing people as they leave a hospital has the advantage

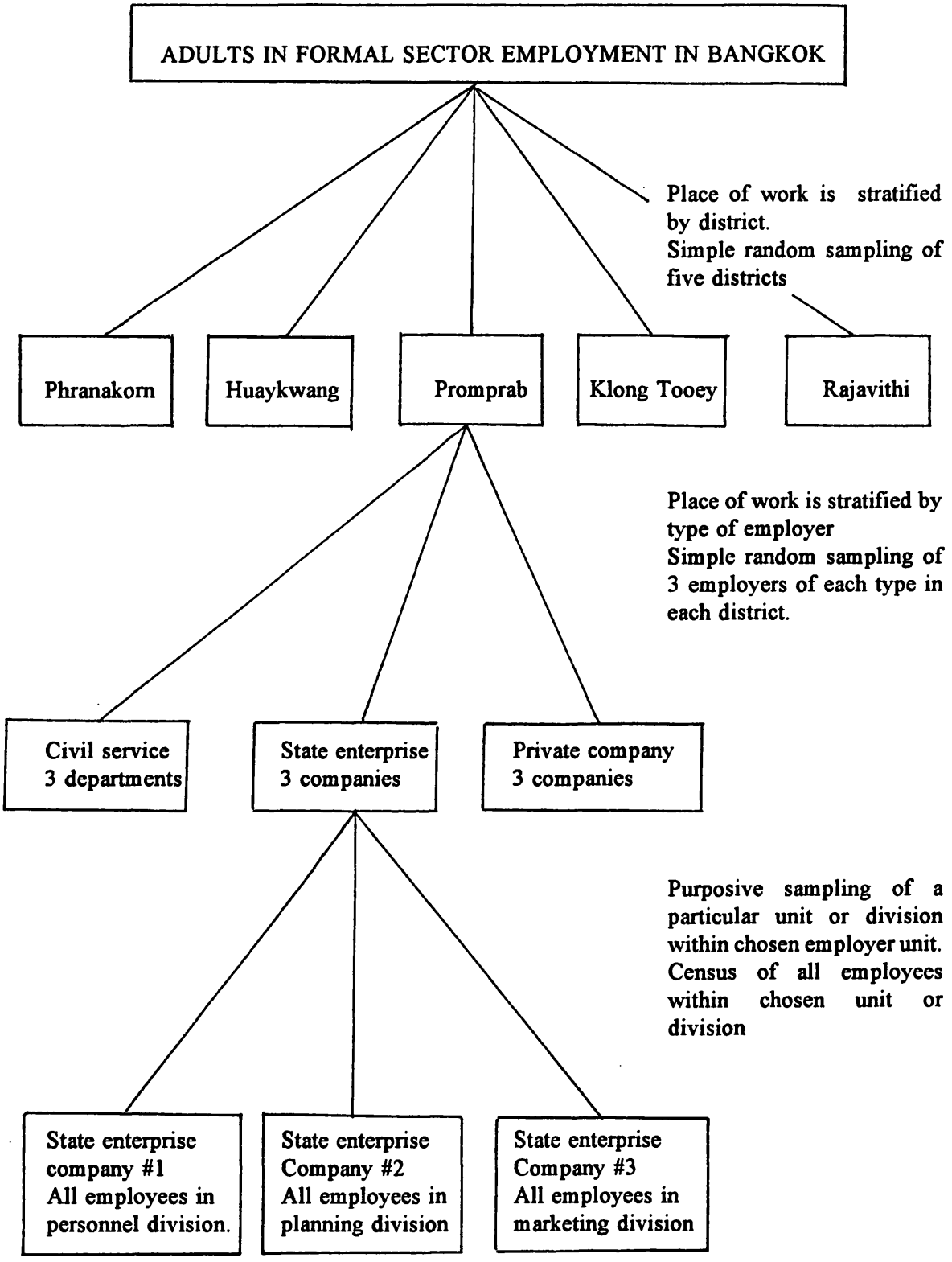
of catching them whilst they are actively thinking about health care, but the sample is likely to be biased towards 'the sick' and it may have been difficult to get permission from private providers. Moreover other studies have found that respondents are unwilling to be critical when interviewed on the premises of a health care provider (Atkinson and Correira 1993, Kanje et al 1992). Given the concern about capturing those with different types of insurance status it was decided to implement the survey at place of work.

The target group for the survey was adults (over 15 years of age) in the middle and upper socio-economic groups and working in Bangkok. Initially it was thought that the sample, although biased to the higher socio-economic groups, should include some representatives of the lower socio-economic groups for comparison. However during the first piloting of the questionnaire it became apparent that those with less education found it very difficult to answer some of the more conceptual questions. Secondly the respondents from lower socio-economic groups included in the pilot had very limited experience of private hospitals and thus found the survey questions difficult to respond to. Although people in lower socio-economic groups use private clinics extensively, they tend to have had less experience with private hospitals. Thus the survey was limited to those in formal sector employment.

A multi-stage sampling design was adopted for the survey in order to get a reasonably representative cross-section of formal sector employees at a reasonable cost. The sampling design is illustrated in figure 5.2. The sampling unit chosen was the place of work.

Knowledge of hospitals and health care seeking behaviour in Bangkok is likely to be affected by where one lives and works. It was impossible to control for both of these but in order to ensure a geographical spread of respondents, work sites were stratified by the district in which they were located and five districts from central Bangkok were randomly selected for sampling: Phranakorn, Huaykwang, Promprab, Klong Tooey, Rajavithi. This strategy also helped reduce travel costs in the distribution and collection of questionnaires.

Figure 5.2
Multistage sampling design for consumer survey



It was believed likely that responses to the questionnaire would be shaped by insurance status, for example those without any insurance may place greater weight on obtaining care at a reasonable price, than those with insurance. Thus the sample was also stratified by insurance status. The following strata were identified:

i. Civil servants provided with health insurance under the Civil Servants' Medical Benefit Scheme;

ii. State enterprise employees covered by the state enterprise medical benefit scheme, which operates along very similar lines to the CSMBS;

iii. Private sector employees in large companies (more than 20 employees) thus covered by the social security scheme;

iv. Formal private sector employees not covered by social security.

For the first three of these categories it was relatively easy to get a sample frame as lists of civil service departments and state enterprises are freely available. The Social Security Office provided a list of businesses covered by the Social Security Scheme. Private sector employees without social security were rather more difficult to identify. Companies without social security could have been identified directly in the field but it was felt that this would be a rather time consuming task, particularly as only employees of small companies are not covered by social security[5]. Instead it was decided to take a sample of non-government organizations. A sample frame for these organizations is readily available and international NGOs are not required to provide social security for their staff. However the NGOs were not drawn from the five sample districts but by simple random selection from throughout Bangkok as there were an insufficient number of them in the five districts.

For the other groups of employers, from each district three departments or companies from each employer type were randomly selected. A particular unit or division within the department or company was chosen on the basis of its willingness to cooperate and the number of employees in the unit. It was aimed to distribute approximately 20-30 questionnaires to each place of work, but in order to avoid a selection bias every employee within the chosen unit was requested to complete a questionnaire. Thus the number of questionnaires distributed at each place of work varied a little.

In a complex survey design such as that adopted, sample size estimations are not

5 At the time of the survey, only companies with less than twenty employees were not covered by social security.

straightforward. Moreover a variety of different types of questions were being posed with different expected means and variance, thus the sample size estimation had to be fairly approximate. On the advice of a statistician it was decided to aim to collect at least 275 completed questionnaires from each insurance category. This would provide approximately 55 responses by type of employer in each district, which was thought adequate to allow for most comparisons. Thus total sample size needed to be 1100. It was estimated that with adequate follow-up a response rate of 75% could be achieved, thus at least 1467 questionnaires needed to be distributed equally between the four groups. In fact 1515 questionnaires were distributed and with a response rate of 80% 1213 valid questionnaires were returned. Appendix 6 gives a full break down of questionnaires distributed and returned.

5.4.3 Implementation of survey

Fieldwork was carried out between July and September 1993. Approximately half of the questionnaires were delivered by hand. A work site would be visited and contact made with the supervisor of a department or unit. The researchers then explained the purpose of the visit and established how many people there were in the unit or department. Questionnaires were distributed to all employees in the unit. A completion date for the questionnaire was agreed with the supervisor (usually 3-7 days later) and this date and the name of the person responsible for collecting the questionnaires was stamped in the space provided on the front of the questionnaire.

For the rest of the questionnaires, initial contact was made by telephone. Permission was sought to carry out the survey, a unit or department was identified and the number of people within the unit established, the name of the person responsible for implementing the survey and target completion date were recorded. The questionnaires were then sent by post with recorded delivery and a return stamped addressed envelope.

All the forms distributed, both by phone and by face-to-face visits, were recorded on a control sheet.

Shortly before the agreed completion date the company or department was contacted by telephone to check whether they were on target for completion or not. Regular follow up telephone calls were made and visits to the work site for collection of the forms if necessary. In this manner a high response rate was achieved.

5.4.4 Data coding, processing and analysis

Most of the fields on the survey form were closed and thus relatively simple to code. A small team of just three coders was used in order to ensure accurate coding. Only two questions left space for completely open responses (q3.1.2 and 3.6.2) these were initially analyzed manually and then a coding system was developed and responses were entered in separate data files. These files were later joined with the main data file.

The data were double entry input into a special Foxbase programme by staff of the Health Statistics Unit, MOPH. The programme for data entry prevented data of an invalid range being entered. The two data sets were then checked against each other using EPI-INFO and any errors corrected.

Analysis of the data files was undertaken using SPSS+. In assessing the characteristics which consumers value, responses to the questions were assigned scores so that the overall importance of different characteristics could be assessed. Analysis of the importance of different characteristics was carried out by condition. Cross tabulations with Chi squared significance test were used to compare responses by those using public and private sector hospitals, by nature of insurance and by other basic characteristics of the respondent. The responses to the open-ended questions on complaints were grouped into eleven main categories which allowed for analysis of type of complaint by type of hospital.

CHAPTER 6
HOSPITAL CHARACTERISTICS AND PRODUCT DIFFERENTATION IN BANGKOK

6.0 INTRODUCTION

Chapter 6 presents the results of the private hospital survey and the investigation of private hospital pricing. Analysis undertaken in this chapter addresses the first set of objectives identified, that is:

i. the characteristics of hospitals in Bangkok are charted (sections 6.1-6.3);

ii. the nature of product differentiation is explored using multivariate techniques (section 6.4);

iii. hedonic price analysis is carried out to investigate the value placed by consumers on various hospital characteristics (sections 6.5-6.6).

6.1 RESULTS OF THE PRIVATE HOSPITAL SURVEY

In 1993 there were 105 private hospitals in Bangkok registered with the Medical License Division. Due to the problems described in Chapter 5 just fifty-two responses to the private hospital survey were received, of these fifty were sufficiently complete and consistent to be considered valid. Two of the valid responses were from very small clinics, without doctors and with only two beds. It was decided to exclude these two cases from further analysis, leaving forty-eight valid cases. A further four of the respondents were highly specialized facilities, one being a dental hospital, two eye hospitals and one an ear, nose and throat hospital. These facilities are included under a separate category in the following descriptive section but are excluded from the later analytical sections.

From the Medical Licence Division records reliable data on the basic characteristics of the whole population of hospitals in Bangkok are available. These data were used to compare basic characteristics of the respondents against the population as a whole (Table 6.1).

Table 6.1
Comparison of Respondent Hospitals and Population

	Polyclinics		Other For-profit		Stock-exchange		Non-profit		All	
	Resp	Pop	Resp	Pop	Resp	Pop	Resp	Pop	Resp	Pop
Response rate	34.7%		51.2%		83.3%		55.6%		45.8%	
N	17	49	21	41	5	6	5	9	48	105
Bed Mean	17.4	15.3	113	120	269	267	261	205	111	87
Bed Median	12	10	100	100	275	266	200	100	200	30
Age (years)	9.4	8.6	9.4	10.3	10.8	11	24.2	23.6	11.1	11
Distance	7.2	8.3	8.3	7.3	8.7	8	1.3	2	7.2	7.4

Source: Private hospital survey and MLD records

The response rate was rather higher amongst larger hospitals; the mean bed size amongst respondent hospitals was 111, compared to a mean of 87 beds in the population as a whole. This may be due to the fact that many small hospitals do not keep the requested patient throughput statistics and thus preferred not to return the form.

The table separates out responses by ownership of the facility. The group of unquoted private for-profit facilities encompasses considerable variation in size and services provided, and hence the group was further sub-divided into 'polyclinics' and 'other for-profit'. An arbitrary cut-off point of thirty beds was used to separate the two groups. More than half of the unquoted private for-profit facilities have less than thirty beds. The response rate was highest amongst those hospitals listed on the stock exchange and lowest amongst the small polyclinics.

With respect to the age and distance of the facility from the city centre the respondents appeared to be largely representative of the population as a whole.

6.2 DESCRIPTION OF HOSPITAL CHARACTERISTICS

What are the different characteristics of hospitals in Bangkok?

Table 6.2 presents basic data on the respondent hospitals in Bangkok. Where reliable data are available comparisons are made between the private hospitals in the sample and public hospitals in Bangkok[1].

6.2.1 Facilities

On the whole, public hospitals, and university teaching hospitals in particular, are considerably larger than private hospitals. Thus although the government has relatively few hospitals in Bangkok these account for more than 60% of the total number of hospital beds. Amongst the private hospitals those quoted on the stock exchange are the largest, followed by non-profit hospitals. Data on both standard items of equipment (ultrasound and x-ray) and high technology equipment (CT, MRI and ESWL) are shown in the table. For the standard items of equipment there is little difference in equipment levels between the stock exchange hospitals, non-profit hospitals and other for-profit ones (data for public facilities were not available). For high technology equipment significant differences emerge; the investor owned hospitals have a much greater complement of high technology equipment than the other private hospitals. The group of 'other for-profit' hospitals have a fairly similar profile of high technology equipment to most government hospitals, despite the fact that they are considerably smaller in terms of number of beds. Only the small polyclinics appear to have a less extensive range of high technology equipment than government hospitals. The University Teaching Hospitals have, as would be expected, a fairly large number of items of high technology equipment, but other government hospitals are less well equipped.

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[1] Public hospitals in Bangkok are owned by a number of different ministries and organizations including the Ministry of Health, of University Affairs, of Defence and various parastatal organizations (such as the State Railways). Also situated in Bangkok are a number of specialist facilities such as the National Cancer Institute, the Dermatology Institute etc. In order to simplify the presentation specialist and parastatal facilities are excluded from the discussion, and only two categories of public hospital are distinguished; the University Teaching Hospitals and other government general hospitals.

Table 6.2
Basic Data on Respondent Hospitals in Bangkok (1992)

		Poly-clinics	Other For-profit	Stock Exchange	Non-profit	Specialist	All pri-vate	ANOVA F-ratio	UTH	Other Govt	All public
N		14	20	5	5	4	48		3	15	18
FACILITIES (mean by group of hospitals)	Bed Number	16.6	116.5	269	261	28.3	111	6.93***	1346	482	626
	CT Scanner	0.43	0.65	1	0.4	0	0. 54	2.63**	2	0.37	0.64
	ESWL	0	0.1	0.4	0	0	0.08	2.39*	1	0.11	0.26
	MRI	0	0	0.8	0	0	0.08	4.53***	0	0	0.0
	Σequip	0	0.7	2.2	0.4	0	0.56	14.85***	3	0.6	0.8
	Ultrasound	0.5	1.15	1.4	1.2	0	0.91	4.25***	-	-	-
	Xray	0.93	2.2	2.2	4	3	2.08	2.06	-	-	-
PHYSICIAN INPUTS	Bed per FT Dr	11.8	10.1	7.6	11.3	11.6	10.6	0.57	3.3	6.8	6.4
	Bed per FTE DR	4	4.3	4.3	7.2	8.4	4.86	2.35*	-	-	-
	% of Drs full time	35.6	46.1	61.6	62.5	66 .1	48	5.07***	-	-	-
	% Specialist Dr	34.5	81.9	95.9	74.1	100	70	7.79***	-	-	-
NURSING	Bed per FT Nurse	5.8	4.3	2.2	2.8	9.4	4.8	1.86	1.2	2.1	1.9
	Bed per FTE Nurse	3.8	3.1	1.5	2.8	6.3	3.4	2.15*	-	-	-
	Bed per FT Nurse Aid	5.5	1.9	4	3.5	0.5	3.5	2.25*	-	-	-
	Bed per FTE Nurse Aid	5.2	1.9	4	3.5	0.5	3.3	2.49*	-	-	-
	% Nurse Aid	31.5	46.8	32.9	31.9	23.4	37	0.84	-	-	-
HOTEL FEATURES	% 'private' beds	19.4	41.9	52.6	40.4	64.4	38	2.83**	3	15	18

SOURCE: Private Hospital Survey
Anova test for null hypothesis that means of different groups of hospitals are equal. Key: *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level

6.2.2 Physician inputs

Three different aspects of physician staffing were examined: the ratio of beds to doctors, full time doctors' hours as a percentage of all doctors hours and the percentage of doctors who had specialist qualifications. The ratio of beds to doctors is examined both with respect to full time doctors alone and all doctors measured in terms of full time equivalents (FTE). One part time doctor was assumed to be equivalent to one quarter of a full time physician. Using this ratio, there appeared to be little difference between the groups of general for-profit hospitals, however both non-profit hospitals and specialist hospitals had significantly more beds per doctor than the other groups. This result appears robust even if the relative weighting of part-time doctors is altered.

Although part time doctors may provide valuable specialist skills not routinely available in a facility, continuity of care may be threatened if hospitals rely too heavily on part-time physicians. In the sample of private hospitals as a whole it was estimated that about 48% of doctors' hours were contributed by full time staff. The small polyclinics and the unquoted private for-profit hospitals have a rather greater reliance on part time staff than stock exchange and non-profit hospitals.

The training of the physicians working in the facilities varies considerably. Only 35% of the doctors working in polyclinics had specialist qualifications compared to 96% in the stock exchange hospitals and 100% of physicians in the specialist hospitals.

With respect to two of the three aspects of physician staffing considered (beds per FTE doctor and percentage of doctors who are specialists), investor owned hospitals would appear to offer better quality services than the other types of hospitals examined.

Virtually all physicians working in public hospitals are full time employees, therefore it is probably appropriate to compare the number of beds per full time doctor in government hospitals with the number of beds per full time **equivalent** doctor in private hospitals. From this comparison it is apparent that although the University Teaching Hospitals have a low ratio of beds per doctor, this ratio is considerably higher at other government hospitals. In fact public non-teaching hospitals have a higher bed to doctor ratio than the group of private hositals taken as a whole.

6.2.3 Nursing

As for physicians, the investor owned hospitals appear to have more intensive nursing profiles than any of the other types of private facility. However non-profit hospitals also have a relatively high complement of nurses to beds which perhaps partially compensates for their high bed to doctor ratios. Specialist hospitals appear to have particularly low staffing by nurses.

The final row on nursing shows the percentage of nursing time provided by nurse aids, this was included in the table because MOPH officials thought that some private hospitals were relying heavily on unqualified nursing personnel. However these figures cannot be properly appreciated without considering the overall ratio of beds to nurses. For example although only 32% of nursing time in polyclinics is said to be provided by nurse aids, the overall ratio of beds to nurses is poor. Moreover the statistics in the table are unable to identify actual staffing patterns at a particular point in the day. With a high ratio of beds to nurses it is probable that during night time hours few or no qualified nurses are available. Interviews with hospital directors suggested that during the past two years nursing costs in Bangkok have risen considerably due to increasing numbers of private hospitals. It is probable therefore that the data in the table present a rather rosier picture than the current situation.

If qualified nurses alone are considered then government hospitals (both teaching and non-teaching) have a much lower ratio of beds to nurses. However the difference in nursing profiles between public and private hospitals becomes less acute if nurse aids are included in the picture. Government hospitals do not employ nurse aids, though untrained cleaning staff may sometimes be called upon to perform some of the functions of nurse aids. The implications of the very different nursing patterns in the two sectors for quality of care is not clear.

6.2.4 Hotel Features

Private hospitals were reluctant to provide detailed information about prices charged for different levels of private room services. However basic data on the number of beds in general wards and the number of private beds were made available. These data were collected with the aim of assessing the hotel aspects of facilities, however it is not a perfect indicator as the nature of the general wards (whether for example they are four, six or twenty bed wards) is unclear. However a significant difference emerges between the stock exchange hospitals and

the rest of the private facilities; in stock exchange hospitals over half the beds are in private rooms, whereas in the rest of the private sector there are 2-3 general beds to every private bed. Small polyclinics had the lowest percentage of beds in private rooms, and non-profit facilities had a surprisingly high percentage of beds in private rooms. Specialist hospitals tended to have a high percentage of private rooms.

6.2.5 Hospital throughput statistics

Table 6.3 presents basic data on hospital throughput. This is presented so as to illustrate differences between hospitals in the type of cases seen and treatment practices; however it should be interpreted with caution. A number of hospitals did not provide any throughput statistics; others provided basic data on number of visits and admissions but did not have sufficiently sophisticated information systems to provide data on hospital days, ICU cases, surgery cases etc. The response rate for small polyclinics was particularly poor; statistics on percentage of ICU cases, percentage of surgical cases and percentage maternity cases in polyclinics are not presented in the table because they were felt to be too unreliable. There are concerns in the MOPH that private hospitals may understate throughput data so that patient revenues will appear low and hence payment to the government in the form of taxes will also be low. However it is not clear that this is the case; first there is no routine effort by government to link throughput with financial data, second discussions with hospital directors suggested that larger private hospitals come under considerable financial scrutiny by shareholders and thus if there is a problem it is predominantly amongst smaller hospitals.

Given the differing sizes of the hospitals it is not surprising that there is considerable variation in the number of visits and number of inpatient admissions. More interesting differences emerge when occupancy rates are considered. There is a growing concern about the over-supply of hospital beds in Bangkok, and the data available from 1992 would support this concern as average occupancy rates hover around 40%. Stock exchange owned and non-profit facilities appear to have rather higher occupancy rates than the other hospitals.

Average length of stay in private for-profit hospitals is routinely low, being generally less than three days. This agrees with the findings of previous studies (Pannurunothai 1993). However length of stay in non-profit hospitals is much higher and is more in line with lengths of stay in public facilities. This partly accounts for the higher occupancy rates in non-profit hospitals.

Table 6.3
Private Hospital Throughput Statistics 1992

	Poly-clinics	Other for-profit	Stock Exch-ange	Non-profit	Special-ist	All private
N[2]	12	14	5	5	4	48
Mean No. visits	29917	116663	290860	145713	61860	110565
Mean No. admissions	1222 (N=11)	9697	14580	8647	1199	7046 (N=47)
Cases admitted to ICU as % all IP cases	N/A	10.6 (N=8)	9.5	4.9 (N=3)	0	N/A
Surgical as % of all IP cases	N/A	35.3 (N=13)	63.9	40.3 (N=3)	90	N/A
Maternity as % of all IP cases	N/A	4.8 (N=13)	11.4	19.3 (N=3)	0	N/A
% maternity cases with CS	N/A	39.1	34.5	36.7 (N=3)	N/A	N/A
Average LOS	1.5 (N=7)	2.8 (N=8)	2.5	11.1 (N=3)	3.3	3.3 (N=27)
Mean occupancy rate	35.0 (N=7)	38.2 (N=8)	47.5	62.5 (N=3)	23.1	38.8 (N=27)

Source: Private Hospital Survey

Despite the better facilities and higher level of staffing at stock exchange facilities it is not obvious that they treat a markedly different case mix to that at other hospitals. Length of stay is no higher than at the other for-profit hospitals. The percentage of cases admitted to the ICU is similar to other for-profits, but there is a small difference in the percentage of surgical

[2] As explained in the text not all of the hospitals provided data for all of the fields in the table. Where the number of respondent hospitals differs from the numbers at the top of the column this is shown in the individual cell.

cases.

The high percentage of maternity cases in non-profit hospitals was biased upwards by one particular hospital (Huachiew) which is renowned for the maternity care which it offers.

6.2.6 Location

Table 6.4 shows the proportion of hospitals which are located within the city centre[3]. A significantly higher proportion of public hospitals are situated in the city centre (Pearson chi square with Yates correction = 10.243, significant at 1% level). The majority of public hospitals, and also notably the non-profit hospitals were established some years ago when it was easier to obtain land in the city centre. Private hospitals are more likely to be located on the periphery: this is probably partly a reflection of the high price of land in the centre but also a response to the demand emerging in the residential suburbs.

Table 6.4
Proportion of hospitals located within the city centre

	N	Percent
PRIVATE HOSPITALS		
Small polyclinics	19	38.0
Private for-profit	17	42.5
Stock exchange	2	33.3
Non-profit	8	88.9
All private	46	43.8
PUBLIC HOSPITALS		
University Teaching	3	100.0
General Public	13	86.7
Parastatal	3	75.0
Specialist	6	100.0
All public	25	89.3

Source: MLD records

[3] Taken to be within a radius of 6 km of Hualamphong railway station.

Figures 6.1 and 6.2 show the location of public and private hospitals respectively: they further demonstrate how clustered public hospitals are with many, including Ramathibodi University Teaching hospital and several specialist institutes, such as the National Cancer Institute and the Tropical Diseases Institute, located in Phyathai district. The few public hospitals located on the outskirts of town tend to be small with just thirty or so beds.

In contrast the private hospitals are scattered throughout the Bangkok Metropolitan Area, although often clinging to the main arterial routes out of town. This is especially noticeable to the west of the city centre on Phetkasem Road, but is also true of hospitals to the north and east. Figure 6.2 suggests a tendency for some private hospitals to locate close to existing prestigious public hospitals. To the west of the Chao Phrya river a cluster of private hospitals have sprung up around Siriraj University Teaching Hospital. Although only two substantial private hospitals (Decha and Phyathai 1) have located in Phyathai district where many of the most prestigious government hospitals are, there are several large hospitals in Chatuchak district just to the north of Phyathai. Part of the reason why private hospitals locate close to existing public ones is likely to be because many private hospitals depend upon the part-time inputs of physicians employed in the public sector. Locating close to good public hospitals ensures the supply of part-time specialists. Indeed several of the private hospitals have well known and close links with a particular government hospital: sometimes the staff of the public hospital helped to establish the private hospital. Furthermore locating in an area which is already renowned for the provision of health care may help to confer a good reputation on the private facility.

Figure 6.1
Location of public hospitals in Bangkok

KEY:

- ● University teaching hospital
- ○ General public hospital
- □ Parastatal hospital
- △ Specialist hospital

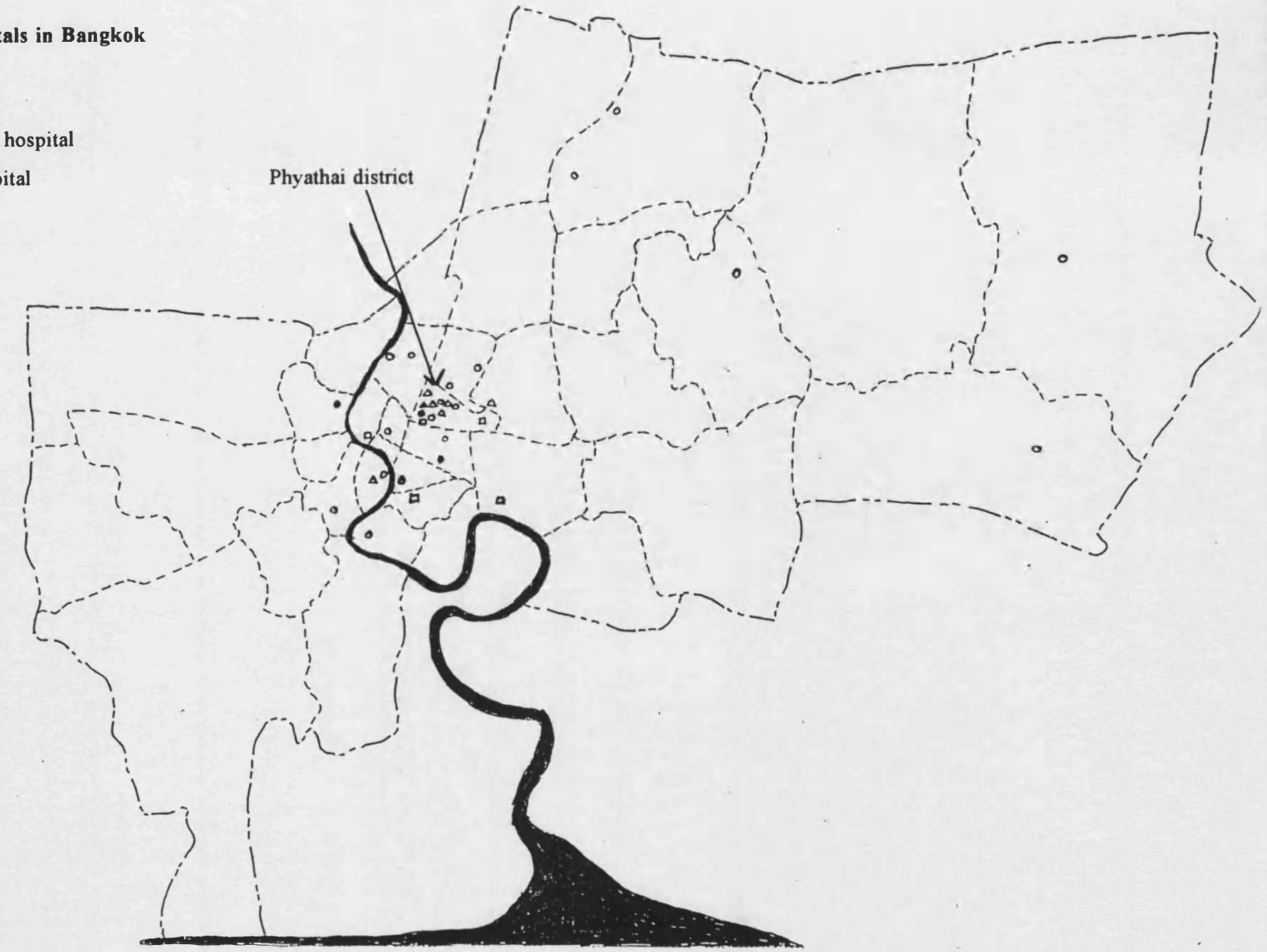
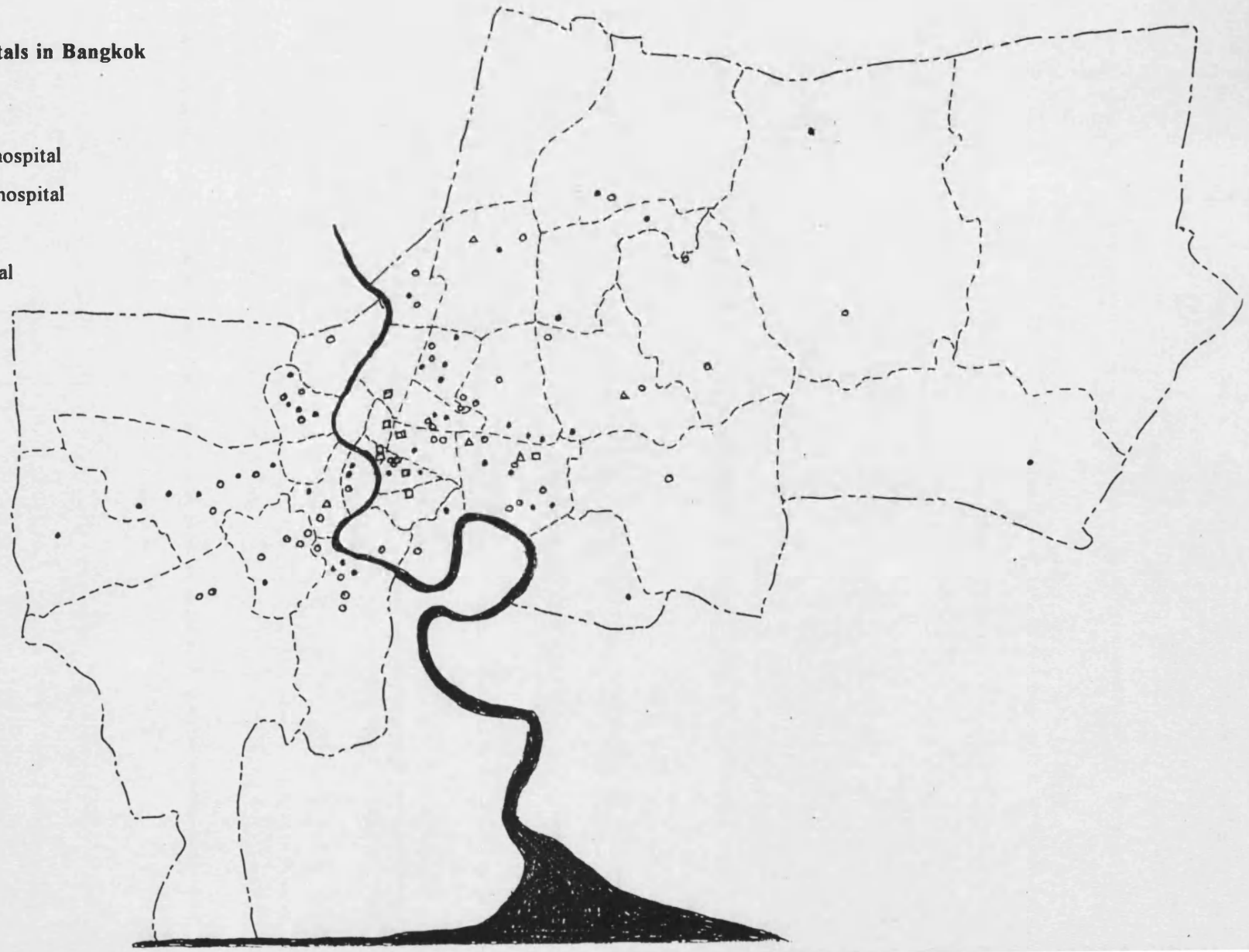


Figure 6.2
Location of private hospitals in Bangkok

KEY:

- ○ Polyclinic or small hospital
- ● For-profit non-SET hospital
- △ SET hospital
- □ Not-for-profit hospital



6.3 HOSPITAL PRICING

Table 6.5 shows some of the most common diagnoses found under the Civil Servants' Medical Benefit Scheme (CSMBS) in private hospitals, the mean, standard deviation and median price charged for these diagnoses, and the same statistics for length of stay. As the coefficient of variation shows, an extremely wide range of prices was found between hospitals even when controlling for diagnosis. The mean price charged for an acute appendicitis and a normal delivery case are similar, about 16,000 Baht[4]. The diagnoses for which the lowest charges were made were very simple conditions such as diarrhoea, dizziness and gastritis. Supporting the hospital throughput data presented in section 6.2.5, lengths of stay in private hospitals under the insurance schemes were very short. Even for more complex conditions such as pneumonia or cerebral thrombosis length of stay rarely exceeded five or six days.

All of the diagnoses in Table 6.5 were included in the calculations of the price index[5]. The two conditions with the lowest coefficient of variation for both price and length of stay (acute appendicitis and normal delivery) were used to consider diagnosis-specific pricing. As the severity of these conditions varied least, it was most likely that the prices charged to the sample cases were an accurate reflection of hospitals' pricing policy.

The final row of Table 6.5 shows the median room charge per night. This was estimated for each hospital for which data was available using primarily information collected from the Civil Servants' Medical Benefit Scheme. According to Davis (1972) hospitals may place a relatively low price on services such as room and board, in order to attract patients, but make up for this by charging more on ancillary services. The standard charge per room per night is approximately Baht400-600.

Appendix 6 lists the price indices described above by private hospital.

[4] In 1992 $1 = 45 Baht approximately.

[5] See Chapter 5 section 5.3.2 for a fuller explanation of construction of the price index.

Table 6.5
Prices and length of stay by diagnosis at private hospitals

Diagnosis	ICD9 code[6]	N	Mean Charge (Baht)	SD	Coeffici ent of variation	Min- imum Charge	Max- imum Charge	Median Charge	Mean LOS (days)	SD	Coeffici ent of variation	Med -ian LOS
Diarrhoea	9.0-9.3	302	4,971	5,685	114.4	420	40,350	3,375	2.22	2.53	114.0	1
Normal delivery	650.0	204	16,221	11,168	68.9	204	76,666	13,919	5.46	2.98	54.6	5
Diabetes	250-250.7	130	16,746	19,910	118.9	905	119,355	8,958	6.24	7.09	113.6	4
Bronchitis	490-490.0	87	7,820	9,148	117.0	1,370	73,262	5,790	3.11	2.54	81.7	3
Pneumonia	486-486.9	71	17,084	24,666	144.4	780	163,558	8,500	5.39	5.22	96.8	4
Acute Appendicitis	541.0	69	16,911	7,246	42.8	1,223	41,752	16,466	4.42	2.29	51.8	4
Dizziness	780.4	63	4,781	5,256	109.9	460	36,495	3,585	2.00	1.71	85.5	1
Cerebral thrombosis	434-434.9	59	16,840	17,099	101.5	1,500	81,263	11,430	5.00	4.33	86.6	3
Peptic ulcer	533-533.9	58	10,422	11,853	113.7	570	47,025	6,370	3.16	2.92	92.4	2
Gastritis	535-535.9	52	4,841	4,512	93.2	780	28,091	3,316	1.96	1.60	81.6	1
Room charge		3481	578	357	61.7	50	1986	450				

Source: Survey of Civil Servants' Medical Benefit Scheme Records

[6] Classification of cases was carried out using the WHO International Classification of Diseases Version 9.

The Spearman Rank Correlation coefficient between the various price indicators was estimated in order to assess how similar the various price indices were. The correlation coefficients showed quite a strong positive correlation in rankings between all four of the indices (Table 6.6).

Table 6.6

Results of Spearman Rank Correlation test between different price indices

	IP price index	Delivery price	Appendix price	Room price
IP price index	1			
Delivery price	0.76***	1		
Appendix price	0.56***	0.66***	1	
Room price	0.66***	0.64**	0.42**	1

*** Significant at 1% level
** Significant at 5% level

Scatter plots of the IP price index against the other measures of inpatient price were used to identify outliers. Decha Hospital appeared to be placed rather higher in the IP index than would be expected than would be expected from the individual price indices. It is possible that more severe cases in one of the other diagnostic categories biased the price index for Decha upwards.

6.4 THE NATURE OF PRODUCT DIFFERENTIATION

What is the nature of product differentiation in the hospital market in Bangkok, and in particular what is the relative importance of vertical and horizontal product differentiation?

Product differentiation may affect the nature of competition in its own right by segmenting the market, but it also exacerbates problems of asymmetric information thus further impeding the functioning of the market. This section considers the extent to which there is a pattern behind the variation in the indicators listed. In particular is it possible to identify vertical or horizontal product differentiation as being dominant? Initially these questions were explored through simple correlation coefficients. Multivariate techniques were then employed to allow a more detailed analysis of product variation. Multivariate techniques have the advantage of helping to identify non-linear relationships between variables (which simple correlation

analysis does not). In addition principal components analysis is a useful tool for identifying underlying dimensions in the data and thus was used in order to see how much of the variation in the variables could be seen as vertical product differentiation compared to horizontal product differentiation.

In Chapter 5 a set of characteristics underlying product variation in hospital care was discussed and possible indicators for examining differences in hospitals were set out. As shown by the coefficient of variation in Table 6.7 there was a high variation in the sample in most of the variables examined. The table categorises specific indicators but it is not necessarily the case that the indicators in one category will all move in the same direction. For example, a hospital may have a high percentage of specialists but low overall physician staffing levels. The final column of Table 6.7 presents the hypothesized relationship between the specific variable and the characteristic.

The final two variables, DISTANCE and AGE, are difficult to interpret. Location is of interest because it reflects accessibility, however the nature of its impact is unclear. Hospitals further from the city centre are probably easier to access from people's homes. On the other hand, transport routes lead into the city centre and many people work close to the city centre. Hospital location may also reflect other characteristics, for example some centrally located hospitals are close to prestigious public hospitals and this may help confer a good reputation. With respect to age, older hospitals may have a more established 'reputation', however reputation is a very difficult variable to measure and age is likely to be only one (probably minor) component of it.

Table 6.7
Key Indicators and their relationship to Health Care Characteristics

CHARACTERISTIC	INDICATOR	MEAN	SD	CV	HYPOTHESIZED EFFECT
Hotel Features	% Private beds of all beds (PERCPRI)	36%	29	80.5	Higher % private rooms implies more comfortable care
Physician inputs	% specialists[7] (PERCSPEC)	68%	38	55.9	Higher % specialists implies better doctors' skills.
	Beds per weighted Dr (BEDWDR)	4.54	2.37	52.2	Lower number beds per dr implies better clinical care, more time for communication.
	% full time Dr[8] (PERCFTMD)	46%	19	41.3	Higher % full time dr implies better continuity and clinical quality of care.
Nursing care	% nurse aid[9] (PERCAID)	39%	30	76.9	Lower % nurse aids implies better nursing care
	Beds per weighted Nurse (BEDWNUR)	3.10	2.5	80.6	Lower number beds per nurse implies better nursing care
Facilities	Equipment[10] (SUMEQUIP)	0.61	0.87	142.6	More high technology equipment implies better facilities
	Bed number (BED_NO)	118.48	149.79	118.48	More beds implies better facilities
Distance	DISTANCE from city centre	7.49	4.01	53.5	?
Age	No years established (AGE)	10.61	7.17	67.6	?

[7] % specialists was based on full time staff alone as nearly all part time staff working in private hospitals are specialists.

[8] % of dr time provided by full time physicians [ie. full time dr/(full time dr + 0.25*part time drs)].

[9] % of nursing time provided by nurse aids [ie. (Full time nurse aids + 0.25*part time nurse aids)/(full time nurse aids + 0.25*part time nurse aids + full time trained nurses + 0.25*part time nurses)]. Very few nurse aids worked on a part time basis.

[10] A simple sum of the items of high technology equipment identified in Chapter 4 (ie. MRI, ESWL, CT scanner).

6.4.1 Correlation Analysis

Table 6.8 is a correlation matrix for all of the key indicators. There is a moderate level of correlation between a number of the variables but none of the correlation coefficients exceed 0.562. The correlation analysis was supported by an examination of scatter plots in case there were any very evident non-linear relationships between variables which the correlation analysis had missed, but this was not the case.

Indicators representing the same facet of care are generally significantly but not particularly strongly correlated with each other. A high percentage of nurse aids is significantly associated with a large number of beds per full time equivalent nurse, suggesting that these two aspects of nursing quality go together. Larger hospitals also tend to be better equipped than the smaller facilities. For doctors' skills that the picture is less clear; a high percentage of specialist physicians working in a facility is associated with a higher percentage of full time doctors, but there is no significant relationship between the number of beds per full time equivalent doctor and the other two variables.

There are also a number of significant positive correlations across characteristics which suggests that there is some degree of vertical product differentiation. For example hospitals with a high percentage of private beds generally appear to be large, well equipped facilities. The percentage of specialists working in a hospital is also significantly correlated with the percentage of private beds, bed number and the equipment indicator. Low bed:nurse ratios are associated with high levels of equipment and a large number of beds.

The final two rows of the table appear to be linked to a lesser degree with the other characteristics, although older facilities do appear to have both a higher proportion of full time doctors and higher bed to doctor ratios. Older hospitals are clearly more likely to be located in the centre of the city. As previously suggested, this probably relates to recent increases in land prices in the city centre and the rapid development of the Bangkok suburbs.

Table 6.8 suggests that some hospitals invest in the complete range of characteristics ie. there is some vertical product differentiation, but this probably does not fully explain patterns of product differentiation. Multivariate techniques were used to explore in more detail the distribution of characteristics between hospitals.

Table 6.8
Correlation Matrix for Key Variables

	PERCPRI	PERSPEC	BEDWDR	PERCFTMD	PERCAID	BEDWNUR	SUMEQUIP	BED_NO	DISTANCE	AGE
PERCPRI	1									
PERCSPEC	0.326**	1								
BEDWDR	-0.140	0.045	1							
PERCFTMD	0.090	0.355**	0.436***[11]	1						
PERCAID	0.275*	0.220	0.050	0.185	1					
BEDWNUR	-0.068	-0.203	0.336**	0.173	0.419***	1				
SUMEQUIP	0.252*	0.496***	0.020	0.185	-0.022	-0.423***	1			
BED_NO	0.319**	0.477***	0.330**	0.242	0.023	-0.268*	0.562***	1		
DISTANCE	-0.082	-0.002	-0.160	-0.176	-0.112	-0.089	0.163	-0.210	1	
AGE	0.118	-0.025	.294*	0.373**	-0.063	-0.095	0.095	0.219	-0.533***	1

Key: Two tailed significance test: *** Significant at 1% level ** Significant at 5% level * Significant at 10% level
N = 44

[11] PERCFTMD is defined as [Number of Full time doctors/(0.25x part time doctors + full time doctors)]. BEDWDR is defined as [No of beds/(0.25xpart time doctor + full time doctor)]. As the denominator of both of these indicators is the same, the high correlation observed between them simply reflects the fact that there is a high correlation betwen the numerators ie. the number of beds and the number of full time doctors.

6.4.2 Multivariate Techniques exploring Product Differentiation

Principal components analysis is useful for identifying the main types of differences between hospitals. The analysis attempts to identify different underlying dimensions in the data. To do this it takes the original variables and finds combinations or indices of these variables (the principal components) which are uncorrelated (Manly 1986). The first principal component explains the largest proportion of variation in the data and as such captures the most important of the variables in explaining differences between the hospitals.

Principal components analysis is particularly useful where the variation in a large number of variables is explained by one or two dimensions. This is most likely to be the case where there are high correlation coefficients between the variables. In the case of Bangkok hospitals there is only moderate correlation between the variables which suggests that several principal components will be required to account for a substantial proportion of the variation. This was indeed the case. Table 6.9 presents the results of two different principal components analyses carried out on the data. In the first analysis DISTANCE from the city centre and AGE were included, in the second analysis they were excluded because of the difficulties in interpreting them. In Analysis 1, the first four principal components are all significant with eigenvalues over one. They explain about 75.6% of the total variance. Seven principal components are required to explain 90% of the variation in the data. In the second analysis three significant principal components together explained 74.2% of the total variance.

The first three principal components in both analyses are fairly similar. Moreover it is quite difficult to interpret the fourth PC in Analysis 1 as none of the variables are particularly strong.

The **first principal component** identifies large, well equipped hospitals with a high percentage of specialists, full time doctors and private rooms. The fact that the first principal component is essentially the weighted sum of hospital facilities, hotel aspects, nursing inputs and physician inputs underlines the presence of vertical product differentiation in the market. Hospitals which scored highly on this principal component were Krungthep hospital, Samitivej, Huachiew, Thonburi, Ramkamhaeng and Phyathai. Small polyclinics had low scores on this dimension (see appendix 7).

In contrast the **second principal component** identifies hospitals with poor staffing profiles:

Table 6.9
Results of Principal Components Analysis

Analysis 1

PC	Eigen-value	Cumul-ative % Var	Eigenvector Coefficients									
			PERC-PRI	PER-SPEC	BED-WDR	PER-FTMD	PER-CAID	BED-WNUR	SUM-EQUIP	BED_NO	DIST-ANCE	AGE
1	2.660	26.6	.484	.694	.314	.578	.168	-.253	.683	.811	-.296	.457
2	2.027	46.9	-.172	-.297	.621	.461	.263	.690	-.483	-.110	-.547	.470
3	1.526	62.1	.409	.331	-.223	.084	.812	.506	-.058	-.119	.217	-.464
4	1.182	73.9	-.439	.103	.532	.301	-.169	.200	.213	.091	.592	-.362
5	0.719	81.1	.300	-.275	.326	-.472	-.037	.165	.011	.406	-.023	-.175
6	0.626	87.4	.485	-.258	.046	.203	-.151	.019	.044	-.230	.379	.244
7	.0493	92.3	-.218	-.288	-.031	-.126	.373	-.022	.378	-.017	.102	.230
8	.0301	95.3	.009	.126	-.066	-.121	-.211	.326	.277	-.155	-.111	.047

Table 6.9
Results of Principal Components Analysis (continued)

Analysis 2

PC	Eigen-value	Cumul-ative % Var	Eigenvector Coefficients							
			PERCP RI	PER-SPEC	BED-WDR	PER-FTMD	PER-CAID	BED-WNUR	SUM-EQUIP	BED _NO
1	2.538	31.7	.519	.784	.161	.458	.160	-.353	.785	.808
2	1.798	54.2	-.005	.021	.636	.603	.543	.814	-.266	.015
3	1.373	71.4	.550	.198	-.644	-.224	.683	.174	-.111	-.241
4	0.731	80.5	.488	-.372	.272	-.388	-.075	.105	-.060	.332
5	.577	87.7	-.423	.023	.051	-.405	.337	.111	.241	.217
6	.418	92.9	.047	-.399	-.024	.169	.123	-.039	.420	-.183
7	.348	97.3	.073	.189	.017	-.141	-.259	.344	.251	-.196

high bed to doctor and bed to nurse ratios, with low levels of equipment and a high percentage of nurse aids. These hospitals were also characterised by a high percentage of full time doctors. This principal component describes hospitals such as Chongchin, Kwong Sui, Bangpakow and VS Polyclinic. The first two of these hospitals are small non-profit hospitals. Bangpakow and VS Polyclinic are polyclinics which are probably owner-operated; this would explain the high percentage of full time doctors.

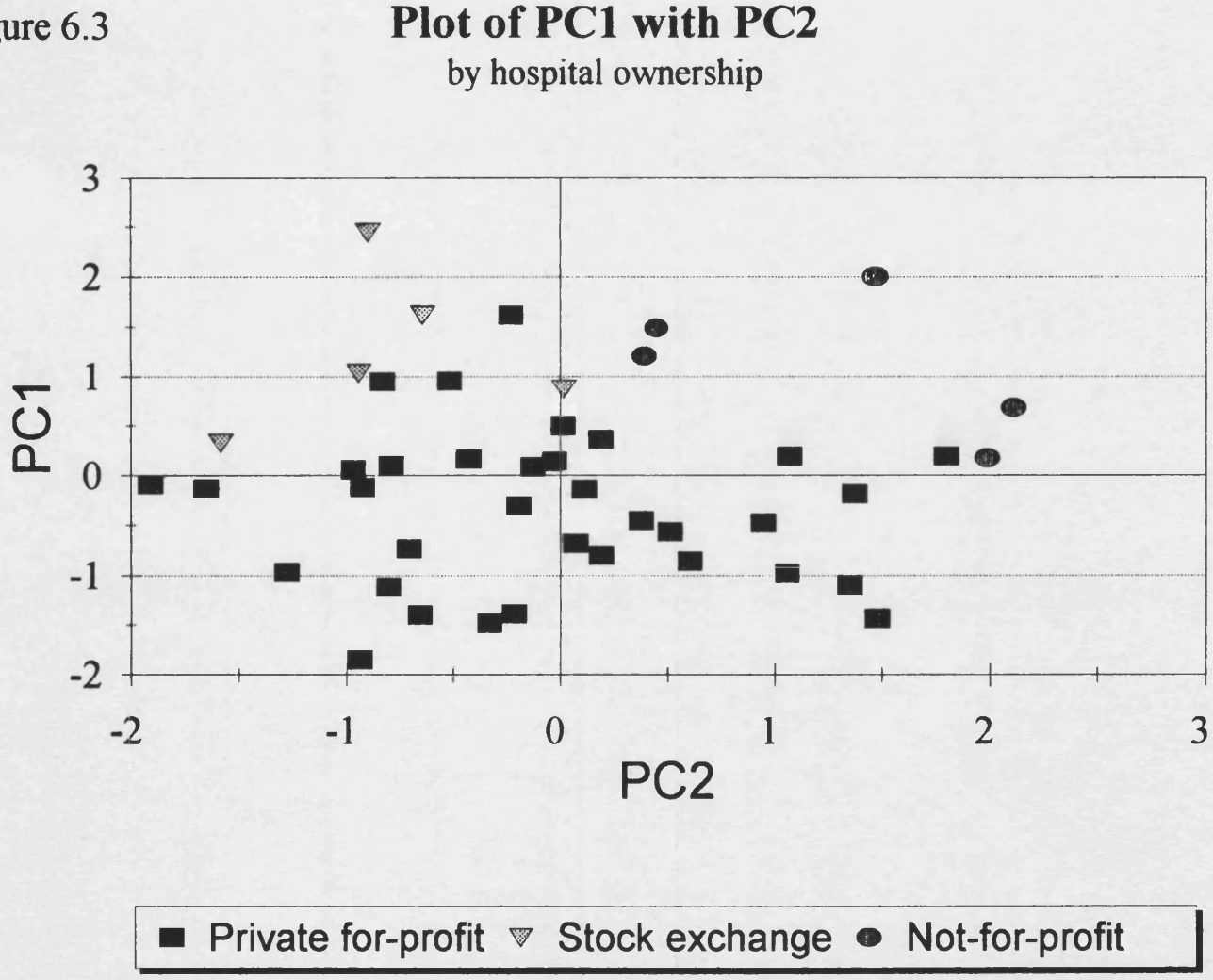
The emphasis in the **third principal component** is on poor nursing standards, both in terms of a high percentage of nurse aids and high bed to nurse ratios, combined with quite a high level of private rooms. It appears that not all of the private hospitals fit the 'high quality in all dimensions' type identified in the first PC. Hospitals which typify this third principal component are Sukhumvit hospital, Rama Suksawat hospital, Pasichaloen and Yaowarak.

Figure 6.3 shows a scatter plot of hospital specific scores for principal component 1 (PC1) against principal component 2 (PC2) by type of hospital ownership (from Analysis 1). It is apparent that the non-profit hospitals tended to score highly on both of these principal components (they are located mainly in the upper right quadrant of the graph); whilst being substantial in size and with considerable facilities they may have lower staffing levels (particularly physician staffing) than other hospitals. They also use a high proportion of full time staff. Stock exchange owned hospitals on the other hand scored high on PC1 but below average on PC2 (they are located in the top left quadrant of the graph). They tend to have a high level of facilities and a high level of staffing. The majority of for-profit but non-stock exchange owned hospitals scored about or below average on PC1 (they are located on the bottom half of the diagram). This reflects the earlier finding that many private for-profit (non-stock exchange owned) facilities are quite small in size.

The fact that the first PC focuses upon vertical product differentiation suggests that this form of product differentiation is the most important **single** way in which hospitals in Bangkok differ from each other. However the first PC accounts for only 30% of the total variation in the variables; six or severn PCs are required in order to explain 90% of the variation in the selected variables. This implies that there is also extensive horizontal product differentiation in Bangkok which accounts for a greater proportion of the variation in the variables.

The principal component analysis provided an insight into the most important ways in which

Figure 6.3


Plot of PC1 with PC2
by hospital ownership
PC1
PC2
3
2
1
0
-1
-2
-2
-1
0
1
2
3
Private for-profit
Stock exchange
Not-for-profit

hospitals might differ from each other. Cluster analysis was used to define specific groups of hospitals which shared similar sets of characteristics. Cluster analysis computes the Euclidean distance between different cases and then groups cases so that those with similar characteristics are close together. One of the main difficulties with cluster analysis is that the groups defined are sensitive to (i) the algorithm used and (ii) the variables included. Thus sensitivity analyses need to be carried out to explore how stable the groups are when these two factors are varied. In order to carry out the cluster analysis all variables were normalized so as to ensure that those variables with large numbers (such as bed number) did not dominate the analysis.

Six or seven clusters were sought on the basis that this number of PCs were required to explain most of the variation in the data. With less than six clusters, one cluster appeared artificially large, embracing a wide range of hospitals. Appendix 8 presents the results of eight different cluster analyses using two different algorithms as a basis for grouping hospitals, and both including and excluding the DISTANCE and AGE variables. Removing other variables such as bed number, percentage of nurse aids and bed to doctor ratio had very little effect upon the composition of the clusters. Of the two different algorithms used one defines clusters based upon the minimum distance between groups (BAV), and the other joins clusters so as to minimize the distance within groups (WAV). Although the hospitals in each cluster do not remain the same across all estimation techniques, there is considerable similarity between the clusters identified.

In most of the analyses Group 3 accounted for a large number of hospitals. The analysis which seemed to distinguish best between the various hospitals in Group 3 was that which minimized the within group average distance and omitted both the AGE and DISTANCE variables. Thus the grouping labelled WAV7 without AGE and DISTANCE was used for further analysis.

The groupings defined by WAV7 are also appealing as they reflect, to some degree, both hospital ownership and the dimensions defined under the principal component analysis. Two of the hospitals in Group 1 (Kwong Sui and Chongchin) are small non-profit hospitals. Group 3 encompasses most of the stock exchange owned facilities in the sample (Samitivej, Ramkamhaeng, Wipawadi). The remaining stock exchange owned hospital (Krungthep) is alone in Group 7. The bigger non-profit hospitals such as Mission and St Louis also fall

under Group 3.

Table 6.10 gives the means by cluster for each of the key indicators.

Table 6.10
Means of key variables by cluster

Variable	CLUSTER							
	1	2	3	4	5	6	7	Anova F-ratio
N	7	1	13	10	7	5	1	
PERCPRI	15.9	31.2	63.2	20.9	21.3	39.9	48.0	5.47***
PERCSPEC	35.7	100	92.8	88.2	7.1	76.7	100	21.23***
BEDWDR	6.4	9.8	3.9	4.3	3.1	4.5	7.0	2.92**
PERFTDR	48.1	64.1	46.5	50.7	28.6	53.4	62.3	1.63
PERCAID	16.0	50.4	40.7	40.5	27.0	83.0	0.0	4.48***
BEDWNUR	2.9	4.2	1.7	2.3	3.5	8.2	1.1	10.29***
SUM-EQUIP	0.0	0.0	1.23	0.7	0.0	0.0	4.0	17.62***
BED_NO	31	750	215	76	14	28	450	34.45***
DISTANCE	7.1	1.0	7.4	8.7	8.0	6.4	7.5	.650
AGE	13.1	14.0	11.7	9.7	9.1	6.0	18.0	.808
IPPRICE	16.1	46.3	126.8	57.4	58.1	74.3	151.9	

Anova F-test with null hypothesis that means for clusters are equal.
Key: *** significant at 1% level, ** significant at 5% level

Group 1 consists of fairly small hospitals with few specialists and a fairly high ratio of beds to doctors. Few beds are in private rooms and high-technology equipment is non-existent.

Limited use is made of nurse aides and bed to nurse ratios are lower than in some groups.

Group 2 consists of Huachiew hospital alone, which is a very large non-profit hospital.

Groups 3 and 7 contain the stock exchange owned hospitals plus the larger non-profit hospitals and some of the larger for-profit hospitals. Hospitals in these groups tend to be large, well equipped, with a high proportion of private rooms. Both bed to doctor and bed to nurse ratios are lower than in most other clusters.

Groups 4, 5 and 6 are entirely for-profit non-stock exchange owned hospitals. They tend to be smaller hospitals than those in the other groups. Group 6 identifies those hospitals with a high percentage of private beds and specialists but poor nursing profiles (previously identifed by principal component 3). Group 5 would appear to consist mainly of small polyclinics with very limited access to specialist physicians. Group 4 consists of mid-size hospitals which are not that different from those in Group 3 except with respect to the facilities available and the hotel features of the hospitals.

Clearly the groups defined by the cluster analysis are loose: slightly different estimation methods result in slightly different groupings. However all of the analyses suggest a similar pattern in terms of horizontal and vertical product differentiation amongst hospitals in Bangkok. At the top end of the market (Groups 3 and 7), vertical product differentiation is dominant: hospitals distinguish themselves from one another through investing in higher quality all round. At the lower end of the market however much more horizontal product differentiation occurs; some hospitals (such as those in Group 6) invest in hotel aspects of care whilst providing much more limited inputs into nursing, other very small hospitals have average doctor and nurse to bed ratios but a very limited number of specialists (such as those in Group 5).

The mean inpatient price index shown in the final row of Table 6.10 also supports this pattern of product differentiation. Whilst the higher quality hospitals in groups 3 and 7 clearly charge considerably more than hospitals in other groups, price differences between the other hospital groups are much less clear.

6.5 THE VALUE PLACED UPON HOSPITAL CHARACTERISTICS

Which hospital characteristics do consumers value most?

In empirical work on product differentiation, hedonic price analysis has commonly been used to estimate the implicit values which buyers place upon different characteristics (see Chapter 2 for a fuller discussion). This technique is used here to explore which hospital characteristics consumers value when selecting inpatient care. Estimates are based both upon the inpatient price index and item specific and diagnosis specific prices. Given the range of potential problems with hedonic price analysis (again see Chapter 2) the results presented here should be interpreted with caution and in the light of the findings of the consumer survey presented in the following chapter.

6.5.1 Estimations using the IP price index

Hedonic price equations were first estimated using the inpatient price index (IP_PRICE). The hedonic price equation is a reduced form equation (reflecting both supply and demand equations), as such the functional form is unclear. It would therefore be inappropriate to impose an a priori form on the data and many empirical studies have used the very general Box-Cox transformation[12]. However use of the unconstrained Box-Cox form has been criticized (Cassel and Mendelsohn 1985, Rasmussen and Zuelhke 1990). The main thrust of these criticisms is that the general Box-Cox form is complex and makes it difficult to interpret the coefficients, moreover use of the Box-Cox transformation increases the number of parameters in the model thus increasing the variance around each parameter. Given the small number of cases in our sample the second of these concerns is particularly relevant.

It was decided therefore to test for linearity in a more direct manner; linear and semi-log forms of the hedonic equation were first modelled and the residuals examined for evidence of non-linearity. In addition quadratic and log-linear forms were experimented with. The ordinary least squares method of estimation was used. As there is no a priori functional form the aim was to select the best-fitting equation.

Table 6.11 presents the results of the hedonic price regressions carried out. The sample size (N=31) is rather smaller than for the analysis of hospital characteristics as reliable price data

[12] The Box-Cox transformation is said to be very general as it has all the principle forms (quadratic, log-linear. semi-log etc) nested within it.

Table 6.11
Hedonic Price Equations No1

	IPPRICE	IPPRICE	IPPRICE	IPPRICE	IPPRICE	IPPRICE (small sample)	IPPRICE (small sample)	LOGPRICE	LOGPRICE	LOGPRICE	LOGPRICE(small sample
DISTANCE	-5.15* (2.48)	-5.43*** (1.83)	-5.29*** (1.77)	-5.23*** (1.78)	-5.48*** (1.78)	-5.66*** (2.06)	-5.87*** (1.95)	-0.046 (0.028)	-0.057*** (0.020)	-0.060*** (0.020)	-0.078*** (0.042)
AGE	-0.35 (1.48)	-	-	-	-	-	-	0.003 (0.017)	-	-	-
PERCPRI	23.61 (29.09)	25.86 (26.29)	28.61 (25.24)	31.89 (25.13)	-	28.46 (27.98)	-	0.203 (0.328)	0.288 (0.293)	-	-
BEDWDR	-14.34* (7.14)	-9.94** (4.46)	-9.01** (3.95)	10.70*** (3.64)	11.16*** (3.66)	-9.86** (4.60)	-9.69*** (3.81)	-0.191** (0.081)	-0.125*** (0.050)	-0.131*** (0.049)	-0.136*** (0.047)
PERSPEC	58.76 (36.67)	65.95* (33.17)	62.29* (31.73)	53.81* (30.82)	61.66* (30.55)	39.72 (39.56)	43.01 (33.74)	1.44*** (0.415)	1.50*** (0.37)	1.60*** (0.36)	1.42*** (0.39)
PERFTDR	-39.81 (49.08)	-49.80 (45.80)	-47.14 (43.93)	-	-	-12.22 (49.50)	-	-1.177** (0.555)	-1.21** (0.50)	-1.28*** (0.496)	-0.92* (0.51)
SUMEQUIP	29.97*** (10.15)	36.38*** (9.53)	28.24*** (8.25)	27.94*** (8.27)	28.64*** (8.35)	33.70*** (9.88)	31.61*** (8.47)	0.326*** (0.115)	0.346*** (0.106)	0.384*** (0.105)	0.377*** (0.102)
BED_NO	0.063 (0.08)	-	-	-	-	-	-	0.001 (0.001)	-	-	-
BEDWNUR	5.96 (5.66)	1.95 (4.10)	-	-	-	2.17 (4.10)	-	0.118* (0.064)	0.067 (0.046)	0.076* (0.045)	0.078* (0.042)
PERCAID	-38.63 (27.35)	-	-	-	-	-	-	-0.343 (0.309)	-	-	-
CONSTANT	122.40*** (38.41)	103.38*** (32.90)	105.80*** (31.98)	95.83*** (30.70)	106.66*** (29.83)	104.22*** (34.39)	117.07*** (33.80)	4.20*** (0.43)	4.08*** (0.37)	4.17*** (0.354)	4.20*** (0.344)
ADJ R2	0.48	0.49	0.51	0.50	0.49	0.49	0.52	0.60	0.62	0.62	0.63
F	3.78	5.13	6.15	7.10	8.28	4.63	8.09	5.54	8.03	9.2	8.47
SIG	0.006	0.0013	0.0005	0.0003	0.0002	0.0036	0.0004	0.0006	0.0001	0.0000	0.0001
N	31	31	31	31	31	27	27	31	31	31	27

Notes: Standard errors in brackets; *** significant at the 2% level; ** significant at the 5% level; * significant at the 10% level.

were not available for all hospitals. Initially all variables were entered into the equation, but it was clear that some variables, namely AGE, BED_NO and PERCAID (proportion of nurse aids) had no effect upon price in any of the regressions analysed. The core variables which consistently explained the largest percentage of variation in price were the ratio of doctors to beds (BEDWDR), the equipment profile of the hospital (SUMEQUIP) and the DISTANCE variable. The remaining variables (PERSPEC (percentage specialists), PERCPRI (percentage private beds), PERCFTMD (percentage full time doctors) and BEDWNUR (the nurse to bed ratio)) appeared to be of some importance but were not always significant.

The adjusted R^2 of the equations is not particularly high, but is acceptable for cross-sectional data. F values were consistently significant. Multicollinearity between independent variables may result in unstable parameter estimates, low t values combined with high R^2 and high F values. However as the results show, the parameters were fairly stable and always of the anticipated sign. It is inevitable that there is some degree of multicollinearity as there was some correlation between variables. However it does not appear to be a substantial problem. Higher order terms included in the regression equation were found to be insignificant. Log-linear forms also yielded poor results. Scatterplots were made of the residuals against both predicted values and the independent variables: the residuals did not appear to increase or decrease with any of the variables suggesting that the assumption of homoscedasticity was not violated.

In order to check further the stability of the estimates four cases were removed from the analysis and the equations re-estimated (in Table 6.11 these estimates are marked as being based on a 'small sample'). The cases which were removed were those which had only a limited number of price observations, and thus where the inpatient price index used was of dubious reliability. As can be seen from the table, estimations based upon the remaining sample of 27 hospitals yielded similar results to those based on all 31.

On the basis of these initial estimations it appeared that the semi-log equations yielded slightly better results than the simple linear model, having a rather higher adjusted R^2, whilst retaining significant variables.

DISTANCE to the city centre was found to be a highly significant variable, yet its interpretation is difficult, particularly given the negative coefficient which suggests that the closer to the centre of town a facility is located, the higher the prices charged. Initially it was thought that people would be prepared to pay a premium for care which was located close to their homes and was easily accessible. As most people live in the suburbs one would expect DISTANCE to have a positive coefficient if this was the correct interpretation. It therefore seemed likely that the proxy of accessibility was measuring different underlying effects. There are three possible underlying effects. Firstly it has already been noted that several private hospitals locate close to existing university teaching hospitals partly in order to ensure adequate staffing, but perhaps more importantly because of the good reputation this confers. As all university teaching hospitals are located in the centre of town it is possible that the accessibility variable picked up this effect. Secondly, there could be a supply side effect; property in the centre of town is likely to cost more and hence prices may need to be higher in order to reflect this. Thirdly the distance variable could be proxying for a measure of competition. Those hospitals close to the centre are more likely to have several competitors close by. Competition is investigated separately in Chapter 8. In order to examine the relevance of the other two effects, DISTANCE was removed from the model and replaced by variables measuring (i) the potential reputation effect from locating close to a university teaching hospital and (ii) the potential cost effect from being located in the centre of the city. A dummy variable (PRESTIGE) was used to measure the potential reputation effect. Any hospital within a two kilometre radius of a university teaching hospital had a value of one awarded to the dummy variable. Hospitals outside of these areas had a value of zero awarded to the dummy. The cost effect arising from location was also modelled through a dummy variable (LOCATION) taking the value zero when a hospital was in the city centre and 1 when it was outside of the centre. The results of these regressions are shown in table 6.12.

The dummy variable representing the reputation effect (PRESTIGE) was of the anticipated sign and significant at the two percent level[13]. Surprisingly the LOCATION variable was not found to be significant; location in the city centre does not automatically raise the price of care.

[13] Decha hospital for which the price index was previously noted to be surprisingly high, is close to Ramathibodi teaching hospital and as such had a PRESTIGE value of 1. Decha increased the value of the coefficient on the PRESTIGE variable, but even if Decha was excluded from the analysis, then the variable was still significant and produced a better fit than the use of the access variable.

In this new set of estimates three key variables emerged in addition to the PRESTIGE variable these were BEDWDR, PERSPECF and SUMEQUIP. Thus the profile of physician staffing appears to be a key factor affecting the total price of care at a facility. Indeed the prestige variable could be seen as also reflecting the reputation of a hospital's medical staff. Given the proxy nature of some of these variables it would seem inappropriate to interpret the coefficients strictly, however the coefficients are indicative of the relative importance of the effect of a particular characteristic on price. The equipment profile of a hospital also appears to be particularly influential in determining the price charged for inpatient care. Nursing profile and hotel aspects of care appear to have very little if any effect on total price. In the re-estimated equations the simple linear model is able to explain a considerably larger portion of the total variation in price than the semi-log models.

Table 6.12
Hedonic Price Equations No 2

	1 IPPRICE	2 IPPRICE	3 LOG(PRICE)	4 LOG(IPPRICE)
PRESTIGE	87.13*** (22.51)	90.86*** (19.55)	0.58* (0.33)	0.83*** (0.27)
LOCATION	-5.08 (14.35)	-	-0.19 (0.19)	-
BEDWDR	-9.70*** (3.25)	-9.38*** (3.06)	-0.14*** (0.05)	-0.12*** (0.04)
PERSPEC	54.56* (26.84)	55.46** (26.27)	1.41*** (0.37)	1.23*** (0.36)
SUMEQUIP	18.72*** (7.50)	18.08*** (7.13)	0.28*** (0.11)	0.175* (0.099)
PERFTDR	-	-	-0.79 (0.57)	-
BEDWNUR	-	-	0.07 (0.05)	-
CONSTANT	68.72*** (27.55)	63.47*** (22.84)	3.81*** (0.40)	3.65*** (0.316)
ADJ R^2 F SIG	0.61 10.36 0.000	0.62 13.37 0.000	0.59 7.18 0.000	0.57 10.82 0.000
N	31	31	31	31

Notes
standard errors in brackets
*** Significant at the 2% level ** Significant at the 5% level * Significant at the 10% level

6.5.2 Estimations using diagnosis specific and item specific prices

How do the hospital characteristics which consumers value vary with different reasons for seeking care?

Hedonic price analysis was also carried out for diagnosis specific and item specific prices, as it was thought that the value placed upon different hospital characteristics may vary with the reason for seeking care. The remaining price measures (price of a normal delivery, price of care for acute appendicitis, and room charge for one night) were all in absolute Baht terms, and it was found that the semi-log model was preferable to the linear one. However for the price of care for acute appendicitis none of the regressions considered were satisfactory, they all yielded extremely low R^2, insignificant coefficients on the variables and the value of the F statistic suggested that the regression as a whole was not significant.

The hedonic equations estimated for the price of a normal delivery and for room charge are shown in Table 6.13. In both cases a fairly substantial proportion of the variation in price is explained and the individual explanatory variables are highly significant. Because of the large number of potential variables which may affect price and the small number of observations (particularly in the case of normal delivery) stepwise regression was used to select the most significant variables.

The most important factor affecting the price of normal delivery appeared to be various measures of physicians' inputs. Both the percentage of specialists out of total physicians (PERSPEC) and the ratio of beds to doctors (BEDWDR) were highly significant and of the expected sign. Indicators of the facilities available at the hospital (BED_NO and SUMEQUIP) were not as significant as in the regression on the IP price index, but bed number was nearly significant at the 5% level.

For room charge a completely different pattern emerged. The most important variable affecting room price was the equipment profile (SUMEQUIP), followed by the percentage of beds in private rooms (PERCPRI). Also found to be significant were the bed to nurse ratio (BEDWNUR) and the DISTANCE variable. These are exactly the factors which one would expect to affect the cost of a room or bed at a hospital. The nature of the effect of location on room charge was explored further by replacing the ACCESS variable with PRESTIGE and LOCATION, as described above. In contrast to the results for the hedonic price regression on

the IP_PRICE variable, PRESTIGE was not found to be significant, whereas LOCATION was. Again this may reflect the underlying costs of providing the service; hospitals located in inner city areas have higher capital costs due to the higher price of land, which may in turn be passed on through the price of the room.

Table 6.13
Hedonic Price Regressions No 3
Price of Normal Delivery and Room Charge as dependent variables

	(1) LNDEL	(2) LNROOM		(3) LNROOM	(4) LNROOM
PERSPECF	2.204** (0.929)				
BEDWDR	-0.371*** (0.117)				
BED_NO	0.003* (0.001)				
SUMEQUIP		0.270*** (0.067)		0.254*** (0.065)	0.251*** (0.063)
PERCPRI		0.652*** (0.187)		0.658*** (0.187)	0.651*** (0.182)
BEDWNUR		-0.065*** (0.024)		-0.065*** (0.024)	-0.064*** (0.024)
DISTANCE		-0.031** (0.015)	PRESTIGE LOCATION	-0.052 (0.200) -0.269** (0.118)	- - -0.256** (0.104)
CONSTANT	8.61*** (0.95)	5.977*** (0.164)		5.94*** (0.153)	5.93*** (0.146)
Adj R^2 F Sig N	0.644 10.66 0.0008 17	0.673 16.98 0.0000 33		0.679 14.13 0.0000 33	0.690 18.28 0.0000 33

Notes
standard errors in brackets
*** Significant at the 2% level
** Significant at the 5% level
* Significant at the 10% level.

It is interesting that a stable hedonic price relationship emerges for a normal delivery but not for acute appendicitis. A normal delivery constitutes elective care; the patient has adequate time to search between hospitals and choose one which best suits her preferences. In contrast many people are likely to see acute appendicitis as an emergency, and to seek care at a local hospital. For acute appendicitis there is certainly very limited time to carry out any search activities. This difference may filter through to hospital price setting strategies; prices for a normal delivery reflect underlying aspects of the service provided whereas for acute appendicitis the price which hospitals charge reflects less the underlying characteristics of the service offered.

6.6 SUMMARY

This chapter has mapped the characteristics of private hospitals in Bangkok, examined the form and extent of product differentiation amongst private hospitals and used hedonic price analysis to examine which hospital characteristics are most sought by consumers.

The results of the private hospital census confirm that a high degree of heterogeneity exists in the hospital market in Bangkok. In particular hospitals differ with respect to their bed number, their possession of high technology equipment and the proportion of doctors employed who have specialist qualifications. There was some significant correlation between different hospital characteristics suggesting the presence of vertical product differentiation; larger hospitals tend to have better staffing, a high proportion of specialists, more high technology equipment and a higher proportion of beds in private rooms. The principal component analysis confirmed the presence of vertical product differentiation but indicated that horizontal product differentiation accounted for a greater proportion of variation in the variables. In particular there were significant differences in the characteristics of hospitals clustered at the lower end of the market. For example several hospitals appeared to have a high proportion of private rooms and specialists, but very limited nursing inputs compared to other hospitals.

In terms of the value placed by consumers upon hospital characteristics, the key variables affecting the total price per case were found to be bed:doctor ratios, the percentage of doctors who were specialists and the high technology equipment profile of the hospital. In addition the distance from the hospital to the city centre was found to be important. Two potential explanations for this were suggested: hospitals which were centrally located are more likely to have higher land costs which could be passed on in the form of higher prices, or

alternatively some hospitals may benefit from a prestige effect generated by locating close to university teaching hospitals. Further analysis suggested that the latter reason was the principal explanation for variations in price per case.

Hedonic price analysis was also used to explain variation in charge per case measures for selected diagnoses and for room charge. Of the two diagnoses considered only that for normal delivery yielded a significant regression equation. This may suggest that the market for normal delivery works more efficiently than that for acute appendicitis (the other inpatient diagnosis examined) where consumers probably suffer from greater problems of asymmetric information. For room charge a very different set of variables were found to affect price, these were the percentage of private rooms, bed to nurse ratios and whether the hospital was centrally located or not. It is most probable that these variables reflect the underlying cost of hospital beds.

CHAPTER 7
CONSUMER KNOWLEDGE AND BEHAVIOUR IN BANGKOK

7.0 INTRODUCTION

After briefly reviewing the basic characteristics of the respondents to the consumer survey, this chapter is structured around five of the objectives identified in Chapter 5. The chapter:-

- further explores the hospital characteristics which consumers value and how this varies with reason for seeking care (objective iii);
- examines how well informed consumers in Bangkok are about the hospital services market (objective iv);
- considers how 'consumerist' people in Bangkok are with respect to hospital care and describes the type of search behaviour they engage in (objectives v and vi);
- investigates how consumers' knowledge about the hospital care market affects their utilization pattern (objective vii).

The consumer survey also revealed interesting information about hospital product differentiation and marketing strategies; these issues are discussed in section 7.6.

7.1 PROFILE OF SURVEY RESPONDENTS

The respondents were fairly equally divided between the four different types of work place, with 29.3% working for government, 24.3% in state enterprises, 21.4% in non-governmental organizations and 24.9% in the private for-profit sector (see Appendix 9). The majority (67.7%) of respondents were women. To some extent this reflects the composition of Bangkok office workers, particularly in the public sector.

Respondents were markedly more educated than the population as a whole. 67.6% had a first degree or higher[1] and 25% had a vocational qualification leaving just 7.4% with only school level education. Average age of respondents was 35 years.

Respondents were asked to indicate their own personal income rather than to make estimates of household income. A relatively normal distribution of responses was found, see Table 7.1, with modal income in the range B6,000-9,999 per month. The latest household socio-economic survey for which data are available indicates that the mean income per earner, in

[1] For comparison it is estimated that in the country as a whole 1987 higher education enrolment rates were about 12% (Tan 1991).

Greater Bangkok, working in a professional, technical or administrative post in 1988 was approximately 8,700 Baht per month (NSO 1990). Inflation has been low in Thailand and mean income is normally considerably higher than modal. Hence the income distribution amongst respondents is probably fairly typical of the professional and administrative classes in Bangkok.

Table 7.1
Frequency of respondents by monthly income

Income in Baht	N	%
< 3,000	14	1.2
3,000 - 5,999	200	17.1
6,000 - 9,999	379	32.4
10,000 - 14,999	304	26.0
15,000 - 24,999	203	17.3
25,000 - 34,999	48	4.1
35,000 - 44,999	11	0.9
>= 45,000	12	1.0
TOTAL (missing = 42)	1171	100.0

It was thought that there was likely to be significant correlation between some of the personal characteristics of respondents; particularly income, education, sex and age. Estimation of the Pearson correlation coefficient indeed demonstrated that this was the case (see Appendix 10). There was a strong positive correlation between age and income, and education and income were also found to be associated. Women tended to earn less than men and were on the whole younger[2], however the pattern varied somewhat between public and private sector employees. In the private sector, education had a stronger impact on income and age a weaker one than in the public sector. Furthermore women in the private sector were significantly better educated than men and did not earn significantly less, nor were they significantly younger.

[2] Regression analysis indicated that sex probably had an effect on income independent of age.

96.3% of respondents said that they had some form of health insurance or medical benefit. However as Table 7.2 shows the pattern of insurance coverage emerging is quite a complex one.

Several respondents had more than one form of insurance, including types of insurance which one would not have expected them to have given their employment status. This can be explained in a number of ways:-

- Public sector employees may be covered by their spouse's employer based scheme, similarly private sector employees may be covered by their spouse's or parents' civil service medical benefit;
- A surprisingly large number of NGO employees are covered by Social Security (SS) despite the fact that this is not compulsory;
- Employees in the private sector who are not covered by Social Security could be newly hired or part time;
- Many employers, particularly the more prestigious ones, continue to operate employer based medical schemes in addition to social security. Since this study was implemented a further survey has confirmed this finding. Panichpathompong (1994) found that the majority of bank employees had employer based insurance schemes in addition to their Social Security coverage and that less than 10% of outpatient attendances took place at their registered social security facility .
- In a self administered survey questionnaire such as this, it is possible that respondents made mistakes in identifying their insurance status. However given the highly educated profile of respondents this effect is unlikely to be substantial.

The responses suggest a considerable complexity in health insurance coverage amongst the sample. This is particularly the case for private sector employees. Whilst public sector employees tend to rely upon the Civil Servants' Medical Benefit Scheme, private sector employees have a wider range of insurance. Indeed 64.2% of private sector employees were covered by at least two forms of health insurance. This multiplicity of insurance cover amongst private employees reduces the probability that they use exclusively the hospital they are registered with under the SS Scheme.

Table 7.2
Number of respondents with different types of insurance by type of employment

Insurance Scheme	TYPE OF EMPLOYMENT									
	Govt empees		Parastatal empees		NGO employees		For-profit employees		Whole Sample	
	N	%	N	%	N	%	N	%	N	%
SSS	10	2.9	9	3.1	151	62.9	271	95.1	441	38.1
CSMBS	328	96.5	285	97.6	26	10.8	7	2.5	646	55.8
Private	32	9.4	26	8.9	76	31.7	78	27.4	212	18.3
Employer	3	2.9	35	12.0	154	64.2	171	60.4	363	31.4
Other	0	0	2	0.7	1	0.4	1	0.4	4	0.3
Total N	340		292		240		285		1157	
Missing	16		3		20		17		56	

The majority of the sample (68.6%) described themselves as being 'quite healthy', 16.8% said they were 'very healthy', 13.2% not very healthy and only 1.4% 'not healthy at all'. Despite the relatively high degree of self-perceived 'healthiness', utilization of health facilities was quite high. The mean number of total outpatient visits during the past year was 4.66 although this was obviously skewed upwards by the minority with chronic complaints who attended regularly. The median number of visits was 3. These visits were relatively evenly spread between public hospitals, private hospitals and private clinics. There was no significant difference in the number of outpatient visits by different types of employment status.

Just 8.4% of the sample had been admitted to hospital during the previous year. Over two-thirds of these admissions had been to private hospitals. Mean length of stay was 9.61 days and median length 5 days, however there were significant differences in length of stay between private hospital admissions (mean 5.69 days, median 4 days) and public hospital admissions (mean 18.34 days, median 10 days) (t value = 2.10 two-tailed, separate variance estimate, significance 0.04). Similar differences between lengths of stay in public and private hospitals have been found in other studies (Pannurunothai 1993), although the average self-reported lengths of stay given in this survey are rather longer than that previously found. There was a significantly greater number of admissions amongst those respondents employed in the parastatal sector and the not-for-profit sector than amongst civil servants and for-profit employees (Pearson chi-square 8.989, significance 0.029). This is difficult to explain on the basis of insurance cover alone, and there were no other obvious differences between the different employment categories (such as age or sex). Those with private health insurance had a slightly higher number of total health care visits and were slightly more likely to be admitted to hospital, but this was not significant.

Women were more likely to be admitted to hospital than men; 74% of those admitted to hospital were women whereas only 67.7% of the sample as whole were women. Women also had a higher mean number of outpatient visits, 5.03 compared to 3.89 amongst men (t value = 2.68, two tailed with separate variance estimate, significance = 0.008). Given the mean age of the sample these differences could be at least partially due to maternity care.

7.2 HOSPITAL CHARACTERISTICS SOUGHT

Which hospital characteristics do consumers value most and how does this vary between different types of reasons for seeking health care?

Table 7.3 shows the scores the respondents gave to each of the hospital characteristics in three different scenarios, which were (i) a cut finger (ii) an appendicitis operation and (iii) a normal delivery. A characteristic was scored **'1' if extremely important** down to **'5' for not important at all**, thus low scores imply a high degree of importance.

Table 7.3
Mean scores for characteristics of health care sought for three different conditions

Characteristic	Cut Finger	Appendicitis	Delivery
Ease of access	1.41 (1)	1.23 (1)	1.29 (3)
Comfortable surroundings	2.46	2.11	1.76
Dr who clearly explains treatment	2.08	1.66 (5)	1.44 (4)
Skilled doctor	2.00 (4)	1.30 (2)	1.18 (1)
Sympathetic and polite nursing	2.05 (5)	1.96	1.79
Inexpensive care	2.16	2.16	2.17
Prompt service	1.65 (2)	1.51 (4)	1.51 (5)
A contact (ie patient knows someone who works at the hospital)	3.54	3.18	3.05
Modern equipment	1.83 (3)	1.34 (3)	1.23 (2)
N	1112	1116	770

Note: The number in brackets represents the ranking of the most important reasons given.

In general the variables which were rated highly were accessibility, skilled doctors, prompt service and modern equipment. However respondents clearly differentiated between the different scenarios. Scores significantly differed across scenarios for all characteristics except the price of the service (see Appendix 11). For a relatively minor complaint such as a cut

finger, access followed by promptness were the main characteristics valued. For an appendicitis, easy access was still considered the most important factor, but skilled doctors became more important, presumably because of the greater complexity of the condition. For a delivery less emphasis was placed upon ease of access and more on clinical quality of care as reflected in doctors skills and the standard of equipment. Although equipment was never the most critical factor it was highly valued in all three scenarios.

When respondents were asked to identify the hospital which they would actually choose to use if suffering from a cut finger, an acute appendicitis, or if they were expecting to deliver a baby then their responses changed a little, as shown in Table 7.4. In this analysis if a characteristic was the most important reason given then it was awarded 3 points, the second most important reason was awarded 2 points and the third reason given, one point. **In table 7.4 high scores represent highly valued characteristics**; if all respondents selected a particular characteristic as their primary reason for selecting a certain hospital then this characteristic would have a mean of 3.

The factors which were previously considered high priority (namely access, skilled doctors, equipment and promptness) were still thought to be important. However price became a rather more important consideration when real decisions had to be made. This is true for all insurance groups. Presumably this implies that amongst those covered by the CSMBS or the State Enterprise Medical Benefit Scheme, co-payment levels are sufficiently high to induce some degree of price sensitivity.

This section of the questionnaire also provided a space for respondents to add their own reasons why they chose a particular hospital. Few respondents made use of this space, but of those who did there were only two responses: the first said that the patient was registered at this hospital under the SS scheme and the second that this was their 'regular' hospital. However surprisingly few respondents listed these reasons.

Table 7.4
Scores for characteristics:
Based on the three most important reasons for choosing a particular hospital

Characteristic	Finger	Appendicitis	Delivery
Ease of access	2.52 (1)	2.09 (1)	1.47 (2)
Comfortable surroundings	0.25	0.19	0.32 (5)
Dr who clearly explains treatment	0.29	0.24	0.37
Skilled doctor	0.88 (2)	1.59 (2)	1.91(1)
Sympathetic and polite nursing	0.32	0.17	0.24
Inexpensive care	0.46 (4)	0.35 (5)	0.37 (4)
Prompt service	0.72 (3)	0.46 (4)	0.29
A contact (ie patient knows someone who works at the hospital)	0.08	0.16	0.23
Modern equipment	0.34 (5)	0.65 (3)	0.74 (3)
SS registered hospital	0.02	0.05	0.05
Regular patient at this hospital	0.01	0.01	0.01

NOTE: The number in brackets represents the ranking of the most important reasons given for choosing a particular hospital.

7.3 Knowledge of hospitals

How well informed are consumers in Bangkok about the hospital services market and in particular the prices and characteristics of different providers?

In order to make informed decisions consumers must be aware of the possible options they have in seeking health care. There was an extremely high rate of recognition of the hospitals listed in the second section of the questionnaire (see Table 7.5). Most people had heard of most of the named hospitals. There was also a fairly high use rate particularly for the public hospitals and Phyathai private hospital. Excluding the small public hospital Klang, 25-40% of the respondents said they had used each of the named public hospitals on at least one occasion. There was wide variation in utilization patterns, whilst 17.5% of the respondents

had not used any of the listed hospitals, nearly 10% of the sample had used five or more of the hospitals listed.

Table 7.5
Respondents' experience with selected hospitals in Bangkok

	Heard of		Used		Family/friend used	
Hospital	N	%	N	%	N	%
Phyathai	1157	99.2	284	25.8	817	74.5
Phra Mongkut	1146	98.5	318	28.5	687	63.8
Chula	1147	98.9	349	31.2	795	73.4
Bangkok Christian	1110	91.5	130	11.7	485	45.0
Krunghdon	1010	87.1	68	6.2	386	36.0
Camillian	791	68.5	62	5.6	206	19.1
Central/Klang	1114	95.6	143	13.0	485	45.1
Samitivej	1119	96.6	66	6.0	46	42.8
Kluay Namthai	1124	97.1	86	7.8	338	31.5
Ramkamhaeng	996	86.1	87	7.9	406	37.7
Huachiew	1150	98.8	143	13.0	603	55.7
Rama	1145	98.7	428	38.5	796	73.7
Bamroongrad	1120	92.3	107	9.8	492	45.7
Thonburi	1012	87.7	91	8.4	453	41.9
Rajavithi	1145	98.5	272	24.7	704	65.1

Respondents' knowledge about the hospitals in the market was examined by asking them to identify the most expensive, the cheapest, the most and least comfortable, the best equipped and the best staffed hospitals from the list. Table 7.6 summarizes the responses across hospitals for each question. Samitivej was the most popular choice for most expensive hospital, followed by Bamroongrad and Phyathai. This closely reflects the actual ranking in terms of price. Thus more than 85% of the respondents were able to identify one of the three most expensive hospitals. Respondents were less certain about which private hospital was the

cheapest; some were unsure which were public and which were private hospitals. Nonetheless Huachiew which is the 'correct' answer was nominated the most times. When asked which hospitals had the best doctors there was a clear vote towards the university teaching hospitals, the two university hospitals cornered 57.4% of the vote between them. Of the private hospitals Samitivej and Phyathai came out best.

Table 7.6
Percentage of respondents identifying a particular hospital for each of the questions

Hospital	Expens-ive	Cheap	Best Drs	Comfort-able	Uncom-fortable	Best Equip-ped
Phyathai	11.8	8.4	10.6	24.9	0.7	13.3
Phra Mongkut	0.3	3.6	4.2	2.4	7.1	4.5
Chula	0.0	5.5	29.3	7.7	7.0	22.4
Bangkok Christian	5.0	6.4	1.3	2.2	2.1	1.5
Krunghdon	0.0	6.1	0.0	0.7	3.2	0.0
Camillian	2.5	4.7	0.1	2.5	0.5	0.4
Central/Klang	0.1	3.6	0.2	0.3	35.0	0.3
Samitivej	59.3	1.3	15.7	32.6	0.6	22.3
Kluay Namthai	0.5	10.5	0.0	0.9	6.3	0.9
Ramkamhaeng	2.1	5.2	0.3	5.4	1.2	0.0
Huachiew	1.5	25.8	0.8	2.0	3.2	1.3
Rama	0.2	3.1	28.1	3.8	8.1	21.6
Bamroongrad	14.9	3.1	5.8	11.1	1.4	9.5
Thonburi	1.7	6.6	2.3	2.0	4.8	0.8
Rajavithi	0.0	6.2	1.3	1.6	18.9	1.3
Total	100	100	100	100	100	100
N	1039	850	983	966	855	957

In terms of comfort the scores were highest for the trio of private hospitals which were also the most expensive; this is also likely to be correct. Again confusion is evident when respondents were asked about the most uncomfortable hospital as is apparent from the high non-response rate to this question. The public hospitals gained the majority of the votes; Klang with the highest, then Rajavithi, then Ramathibodi. Finally in terms of the best equipped hospitals Ramathibodi (UTH), Chulalongkorn (UTH) and Samitivej all received roughly the same votes. Bamroongrad which was perceived as expensive did not do very well in terms of consumer perception of availability of equipment or comfort of surroundings.

It is clear from these answers that respondents have considerable knowledge about the characteristics of different hospitals and there is a surprising degree of consensus about the attributes of different hospitals. Moreover the respondents were able to discriminate between different characteristics of care. Whilst the university teaching hospitals were perceived to have very good staff and reasonable equipment they did quite badly in terms of comfort. Samitivej is seen to be good all round but to be prohibitively expensive. Respondents were relatively well informed about the top of the market but were far less sure at the lower end of the market; which are the cheapest hospitals, which are the most uncomfortable? This may reflect the relatively high socio-economic profile of the respondents. It is likely that people gather information more about the hospitals which they would like to use rather than those which are generally perceived as not being very good.

7.4 CONSUMERIST BEHAVIOUR

How consumerist are people in Bangkok with respect to the health care market?

Respondents were asked questions concerning different types of consumerist behaviour including:-

- *Information seeking behaviour*; attention paid to advertisements, advice sought from friends and relatives, tendency to seek information on price;
- *Quality and price sensitivity*; willingness to change provider due to changes in price and quality, inclination to complain about low quality care or high prices;
- *Independence from medical advice in decision making*; willingness to seek a second opinion.

7.4.1 Advertising

Nearly one third of the respondents said that they had heard or seen an advertisement for a private hospital within the past one month. Many of those hospitals with recent heavy advertising campaigns were relatively new hospitals (Pharam 9, Ladphrao, Theptarin, Chao Phrya) which were presumably still fighting for market share. However some of the relatively well-established hospitals also had surprisingly active advertising campaigns this is particularly the case for Phyathai, Kluay Namthai, and Bamroongrad. It is unclear from this survey whether these three hospitals happened to have advertising campaigns which coincided with the survey or whether they constantly maintain high levels of advertising. It was also interesting to note that some of the non-profit hospitals (including Bangkok Christian, Mission, Huachiew and St Louis) had recently issued advertising material.

The key test of advertising is not so much recall, but rather the extent to which it shapes perceptions of different hospitals and ultimately utilization. Interestingly advertisements, as recalled by the respondents, did not appear to differentiate clearly one hospital from another, except with reference to special services delivered. For example one might expect a hospital such as Kluay Namthai to promote itself on the basis say of prompt service and reasonable price, whereas Phyathai may try to raise public awareness of its access to specialist skills and high technology equipment. However from the rather limited data available this does not appear to be the case. Samitivej, one of the most expensive hospitals in Bangkok was focusing advertisements on promptness of service.

The three attributes mentioned in advertising and most commonly recalled by respondents closely match those which were in general most valued; promptness, specialist physicians and equipment. Unfortunately because the characteristics mentioned by different hospitals in the advertising campaigns were all so similar it was difficult to discern the impact of the campaigns on consumer perceptions of different providers. Moreover the survey form asked only about recent advertising and thus takes a snapshot rather than looking back at previous campaigns which may have influenced consumer choice. It is clear however that advertising may have very little impact on consumer perceptions. Take for example Kluay Namthai whose advertising campaign several respondents recalled; the campaign focused principally on the specialists working at Kluay Namthai and the modern equipment available. However in part 2 of the questionnaire not one respondent had suggested that Kluay Namthai had the best doctors of the listed facilities, and only nine thought that it had good equipment.

With a questionnaire of this type it is only possible to examine the impact of advertising on perceptions and utilization in a simplistic manner. Table 7.7 shows for a select number of hospitals the proportion of respondents who chose to use the hospital for treatment of a cut finger or an inflamed appendicitis[3] in the first section of the questionnaire, categorised by whether or not they recalled an advertisement for that hospital. Advertising had no apparent direct effect on utilization of Phyathai, Kluay Namthai or Bamroongrad; proposed utilization rates did not differ between those who did and those who did not recall the advertisements. Those respondents who recalled advertisements for Pharam 9 and Ladphrao appear more likely to use these hospitals, however this could be due to the fact that many respondents who recalled advertisements for these hospitals lived close to them.

Table 7.7
Proposed utilization of hospitals by those recalling and not recalling advertisements

	Recalled advertisement			Did not recall				
Hospital	Total N	Will use N	Will use %	Total N	Will use N	Will use %	Chi Sq	sign.
Pharam 9	62	3	4.8%	966	9	0.9%	7.71	0.006
Phyathai	35	2	5.7%	993	58	5.8%	0.00	0.975
Kluay Namthai	28	1	3.6%	1000	18	0.1% 0.471	0.47	0.492
BMG	22	0	0.0%	1006	29	0.1%	0.65	0.419
Ladphrao	25	1	16.0%	1003	22	1.8%	18.86	0.000

NOTE: Chi square with Yates correction was used but due to the small expected number in some cells tests were also run with Fisher's exact test. Fisher's exact test confirmed the significance of differences in proposed utilization rates for Pharam 9 and Ladphrao hospitals.

7.4.2 Advice from friends and relatives

About 75% of respondents said that they had sought advice about which hospital to go to from a friend, relative or health care professional on at least one occasion. A small minority of the group (6.2%) sought advice regularly, but the majority (48.7%) had sought advice just once.

[3] The question regarding a normal delivery was excluded from this analysis as only women were asked to respond to this question.

Table 7.8 shows whom respondents had sought advice from. Colleagues and friends were the most common source of advice about which hospitals to use but it was also common to consult parents and other relatives. Although about one quarter of those who had sought advice had asked a doctor, doctors were nonetheless relatively insignificant in influencing patterns of hospitals usage compared to friends and relatives.

Table 7.8
People from whom advice was sought

Source of Advice	Number seeking advice	% who had sought advice from this source
Parent	211	23.3
Brother	100	11.0
Sister	185	20.4
Son or daughter	26	2.9
Other relative	316	34.8
Colleague or friend	747	82.4
Doctor	239	26.4
Other health personnel	44	4.9
Total N	907	

NOTE: the percentage column sums to more than 100% as respondents sought advice from more than one source.

7.4.3 Price seeking behaviour

The evidence relating to price presented in section 7.2 was mixed: it appeared that although price was not the prime factor in decision making about health care it did play some role. Further evidence was sought on this issue by asking respondents whether they specifically ask to see the price list or enquire about the price of a service before being treated. The question was asked separately for public and private hospitals and an extra question was posed asking whether hospitals themselves informed patients (so that patients would not need to ask). As Table 7.9 shows about one third of respondents said that if they sought care in a private hospital they would ask the price before being treated. A further 92 respondents claimed that the private hospital would inform them of the price before treatment.

Table 7.9
Price seeking behaviour in public and private hospitals

	Public hospitals		Private hospitals	
	N	%	N	%
Ask price	156	13.4	380	33.6
Don't ask	1009	86.6	751	66.4
Missing	(48)		(82)	

Respondents, for understandable reasons, were considerably more likely to ask the price in the private than in the public sector (McNemar test for two related samples, Chi sq = 175.28, probability = 0.000). Both public and private hospitals are statutorily required to display a price list. Most public hospitals do this. The practice is less commonly observed amongst private hospitals, but even if it is, it may be difficult for patients to estimate what the total bill will be unless they ask.

Insurance coverage is likely to affect consumer sensitivity to price, but no significant difference in the proportion of respondents asking for price was found between respondents in different types of employment with different insurance schemes. However as already discussed, public sector employees are likely to incur significant co-payment in the private sector and as SS workers tend to use hospitals where they are not registered, they may bear the full price of care. More tellingly no significant difference was found in price seeking behaviour between those with private health insurance or employer provided insurance and those without either of these types of insurance (Chi sq = 1.026, probability = 0.311). There appears to be a general disinclination to ask the price of a service which cannot be explained by insurance coverage.

7.4.4 Price and quality sensitivity

Just over 50% of respondents said that they had a hospital which they used on a regular basis. Further analysis showed that 54.4% of these regular hospitals were privately owned, 44% were publicly owned, and the remaining 1.5% were small private clinics rather than hospitals. The most popular 'regular' hospitals were Phyathai (private) and Ramathibodi (public UTH). Others in the 'top ten' were Chulalongkorn, Rajavithi, PhraMongkut, Siriraj, Krungthep, Thonburi, Bamroongrad and Ramkamhaeng (in descending order of popularity).

We were interested in how strong an allegiance people had to a particular hospital. To test this three scenarios were suggested and people were asked whether they would change hospitals under these conditions. The three scenarios were (i) a 50% price increase (ii) a change of doctors (iii) if the respondent were to move away from the hospital.

Table 7.10
Allegiance to regular hospital in face of three changes

	50% Price increase		Change of doctor		Moved away	
	N	%	N	%	N	%
Keep using	243	40.9	278	46.4	184	31.0
Change hospital	119	20.0	123	20.5	274	46.1
It depends	232	39.1	198	33.1	136	22.9
Total	594	100.0	599	100.0	594	100.0

Table 7.10 reveals a relatively strong allegiance to the respondents' regular hospital. Only 20% would definitely change hospital if the price went up by 50% or if there was a change in doctors. Respondents were rather more sensitive to accessibility. Nearly half would change their regular hospital if they were to move away from the locality.

Table 7.10 hides quite distinct differences between those whose regular hospital is under private ownership and those who use public hospitals (see table 7.11). Allegiance to public hospitals is considerably higher in all three of the scenarios given. People seem to act in a rather more consumerist fashion if they seek care in the private sector: respondents who use a private hospital were particularly likely to change hospital if there was a price increase or if they moved. This is probably due to the generally higher prices in private sector and the fact that accessibility is a common reason for using a private hospital. In contrast, in the public sector the price is low (and therefore people are relatively insensitive to price changes) and as most public hospitals are in the centre, people are probably already travelling in order to use them.

Table 7.11
Allegiance to regular hospital by ownership of hospital (in %)

	50% price increase		Change of doctor		Moved away	
	Private	Public	Private	Public	Private	Public
Keep using	26.5	58.9	41.2	52.7	21.1	43.8
Change hospital	31.2	6.2	26.1	14	56.8	33.2
It depends	42.3	34.9	32.7	33.3	22.1	23
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	317	258	317	258	317	258
Pearson chi square significance	80.53 0.000		13.57 0.001		41.31 0.000	

7.4.5 Dissatisfaction with hospital services

Nearly 50% of respondents said that they had on at least one occasion been very dissatisfied with the service which they had received at a hospital. The majority of these complaints (68%) related to public hospitals. To some degree the pattern of dissatisfaction by hospital reflects utilization patterns; those hospitals which were used more commonly tended to have a larger number of complaints about them. Appendix 12 takes a selection of the most commonly used hospitals in Bangkok and compares the percentage of complaints received by a hospital with the percentage of proposed utilizations in part 1 of the questionnaire. The final column of the table shows the ratio of complaints to predicted utilization. If the ratio is greater than one this implies that there are more complaints than average given the utilization rate.

In general respondents were disproportionately dissatisfied with care received at public hospitals. However there were some exceptions to this; amongst private hospitals Kluay Namthai, Paolo Memorial and Samitivej received rather more complaints than one would expect. Of the public hospitals, Central/Klang and the three university teaching hospitals received an exceptionally high level of complaints.

Even if respondents were unhappy with the service received they were on the whole reluctant to do much about it. More than 30% of dissatisfied respondents simply accepted the poor quality of service and did nothing. The next most common option was to resolve not to use the facility again. Of those who had made such a resolution, about 17% had actually returned

to the facility. Table 7.12 summarizes the actions taken by dissatisfied respondents.

Table 7.12
Actions taken by respondents when dissatisfied with care[4]

	Public Hospital		Private hospital		All hospitals	
	N	%	N	%	N	%
Accept and do nothing	112	33.33	36	23.22	172	30.44
Resolve not to use again	114	33.92	43	27.74	187	33.10
Make a complaint	27	8.04	31	20	64	11.33
Change hospital immediately	27	8.04	19	12.26	51	9.02
Resolve not to use again and change hospital immediately	31	9.23	10	6.45	47	8.32
Complain and resolve not to use again	16	4.76	7	4.52	25	4.42
Other combination of actions	9	2.68	9	5.81	19	3.36
TOTAL	336	100.00	155	100.00	565	100.00
Missing	9		6		13	

Again there is a noticeable difference between attitudes to public and private hospitals. People are far more willing to complain at private than public hospitals; only about 14% of those who were dissatisfied with service in a public hospital complained versus about 25% in private hospitals. There are a number of possible explanations for this including:

i. Consumers' tendency to complain about a problem may depend on the nature of the problem. As problems differ between public and private hospitals so does the tendency to complain.

ii. People are more willing to behave in a 'consumerist' fashion in private hospitals as they view the transaction more like a normal market transaction.

iii. People are less likely to complain in a public hospital as they feel it to be a futile activity, unlikely to lead to improvements in quality of care or any form of

[4] The first two columns (public and private hospitals) do not sum to the final column (all hospitals) as several respondents made a complaint but did not specify which hospital they were complaining about, thus hospital ownership is unknown.

compensation.

In order to test the applicability of the first of these explanations respondents' tendency to complain was examined by the nature of the problem (see Table 7.13). Although not all the results are statistically significant, respondents seemed more likely to complain in the private sector than in the public, for each of the problems identified with the exception of doctors' skills. Thus explanations (ii) and (iii) would appear to be more relevant.

Table 7.13
Tendency to complain by nature of problem

	Manner		Promptness		Dr Skills		Poor Man-gement		Overall	
	Priv	Public	Priv	Public	Priv	Public	Priv	Public	Priv	Public
Complain N	10	24	13	9	4	3	6	5	38	43
%	26	18	37	9	18	21	32	16	25	13
Total N	38	137	35	98	22	14	19	32	155	341
Chi Sq with Yates correct.	1.47		14.61		0.058		1.789		11.05	
Significance	Not signif		sig at 0.001		Not signif		Not signif		sig at 0.001	
Overall %	19.4		16.5		19.4		21.6		16.33	

7.4.6 Consumer reactions to high fees

Respondents were also asked whether they felt that they had ever been charged too much for a service. Only 28.3% of respondents (N=328) said that they had been over-charged and the vast majority of these complaints related to the private sector (94.9% of complaints). Table 7.14 lists the hospitals which were most commonly cited as charging too much for service. However like the general dissatisfaction with hospitals, these complaints need to be placed in the context of hospital utilization. Thus the final column of the table compares the proportion of complaints about a hospital against predicted utilization of that hospital. Again ratios greater than one suggest a larger number of complaints than expected. For most of the private hospitals listed there are more complaints about the price than one would expect given utilization of these hospitals. The difference however is particularly marked for (i) Samitivej (ii) Bamroongrad (iii) Kluay Namthai and (iv) Paolo Memorial.

Table 7.14
Hospitals with most complaints about expensive care

Hospital	Number of complaints	As % of all complaints	Number of proposed utilizations	As % of all proposed utilizations	Ratio Complaints :Use
1. Bamroongrad	29	10.51	60	2.11	4.98
2. Phyathai	27	9.78	142	5.01	1.95
3. Thonburi	25	9.05	126	4.44	2.04
4. Samitivej	23	8.33	23	0.81	10.28
5. Ramkamhaeng	20	7.25	165	5.82	1.25
6. Paolo Memorial	15	5.43	50	1.76	3.09
7. Kluay Namthai	12	4.35	34	1.20	3.63
8. Bangkok Christian	8	2.90	39	1.38	2.10
9. Krunthep	8	2.90	65	2.29	1.27
10. Wichaiyudht	7	2.53	49	1.73	1.46
11. Wipawadi	7	2.53	67	2.36	1.07
12. Mayo	6	2.17	63	2.22	0.98
Total N	276		2834		

As for general dissatisfaction with a hospital service, respondents were extremely reluctant to complain about the high price of care. 38.15% of respondents simply accepted the bill and paid as required, 50% decided not to use the hospital again. Less than 5% of respondents who felt they had been over-charged tried to negotiate or question the bill. However of those who had resolved never to use a particular hospital again the vast majority (86%) had never returned. Amongst the whole group of those who felt they had been over-charged 38% had returned to that hospital.

7.4.7 Independence from medical advice

Respondents were asked about their tendency to seek a second opinion in order to assess the extent to which consumers were willing to question the authority of a doctor and seek extra advice from elsewhere. A surprisingly high proportion of the sample (39.7%) said that on at least one occasion they had sought a second opinion. Respondents were then asked whether they would recommend a close family member to get a second opinion for (i) cancer diagnosis and (ii) a Caesarian section when the initial diagnosis had been provided in three different types of hospital settings [(i) by a general doctor in a public hospital, (ii) by a specialist in a university teaching hospital and (iii) by a specialist in a private hospital]. The results of these questions are shown in Table 7.15. Respondents felt that it was more important to get a second opinion for the diagnosis of cancer than for the recommendation to have a Caesarian section. There were also differences in respondents' inclination to get a second opinion in different hospital settings: for both conditions respondents were most inclined to get a second opinion when the first had been given by a specialist in a private hospital (see Cochran's Q test results in Table 7.15). This finding again suggests a greater tendency to act in a consumerist manner when seeking care in the private sector.

Table 7.15
Proportion of sample agreeing and disagreeing with need to seek a second opinion for diagnosis of cancer and recommendation for Caesarian Section

		General Dr Public Hospital	Specialist Dr - UTH Hospital	Specialist Dr - Private Hospital	
Cancer	Agree	77.9%	75.8	80.6%	Cochran Q test for difference between hospitals: Q = 15.33 sign = 0.0005
	Disagree	22.1%	24.2	19.4%	
	N	1112	1108	1117	
	Missing or uncertain	101	105	96	
Caesarian Section	Agree	49.3%	52.5	53.6%	Cochran Q test for difference between hospitals Q = 12.88 sign = 0.0026
	Disagree	50.7%	47.5	46.4%	
	N	1046	1044	1047	
	Missing or Uncertain	167	169	166	

7.5 KNOWLEDGE AND BEHAVIOUR

How do consumer knowledge and preferences about the health care market and consumer characteristics affect utilization patterns?

When patients were asked to indicate the hospital which they would actually choose for a cut finger, a normal delivery or an appendicitis, private sector hospitals were more commonly chosen than public hospitals for all three of the conditions. For the group of respondents as a whole it appeared that there was a greater tendency to seek private care for relatively minor conditions (such as a cut finger), but as the condition became more complicated, respondents were more likely to go to the public sector. However on closer examination it became clear that this was **mainly true of public sector employees where there was a clear financial incentive to seek public sector care**, particularly for more serious conditions where the level of co-payment in the private sector would be high (see Table 7.16). Amongst private sector workers there was only a moderate drop in the percentage of people using private hospitals as the condition became more complicated.

Table 7.16
Respondents saying they would seek care in a private hospital

Condition	Public sector employees		Private sector employees		Whole sample	
	N	%	N	%	N	%
Cut finger	386	66.1	369	74.8	755	70.1
Appendicitis	336	57.4	357	73.5	693	64.3
Delivery	160	42.7	218	70.1	378	55.1

Dividing the sample into those who elected to use a private hospital and those who chose a public hospital very little difference was found between the reasons given by the two groups (see Appendix 13). The principle difference lay in price. For example using the scoring system described in section 7.2 where a variable was awarded three points if it was the main reason for seeking care at a particular hospital, two points if it was the second most important reason and one if it was the third, the mean score for 'inexpensive care' as a reason for seeking treatment at a private hospital was 0.37 compared to more than double that (0.86) in the public sector. The private sector consistently scored better on promptness, and surprisingly also on skilled doctors, but some of these differences were small. The scoring patterns of public and

private sector employees were compared, but appeared to be very similar.

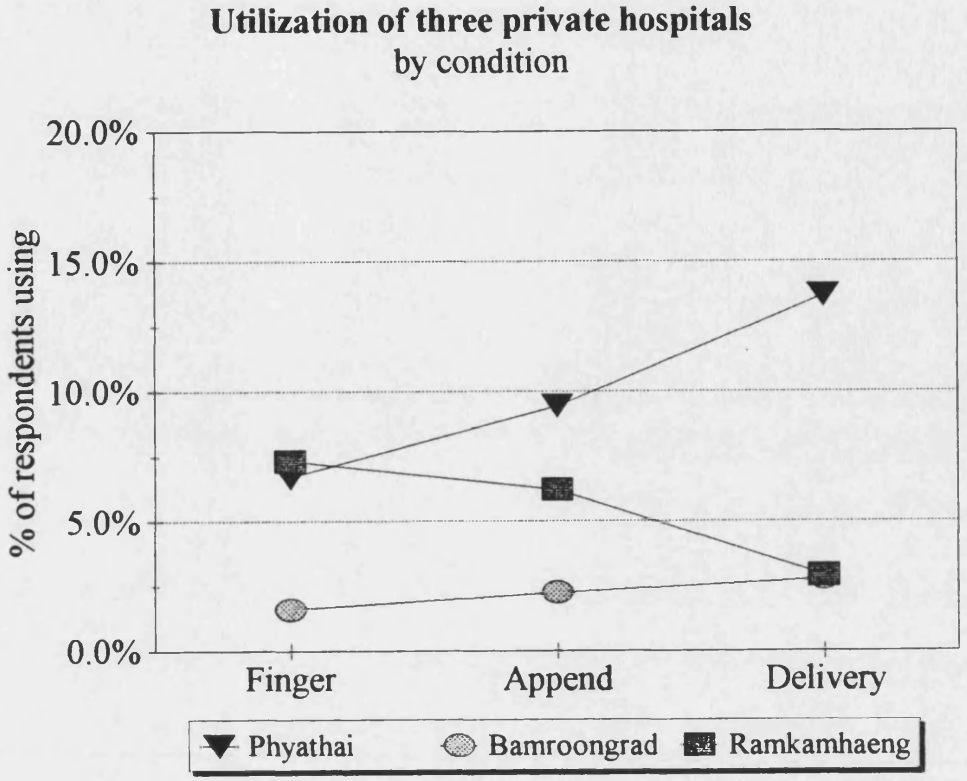
Very few respondents covered by social security gave as a reason for using a particular hospital the fact that they were registered with that hospital. In fact it would appear that few persons covered by social security elected to use the hospitals with which they were registered. However this is hardly surprising given the fact that 68.9% of workers with SS questioned were also covered by more flexible forms of health insurance such as private insurance or employer schemes.

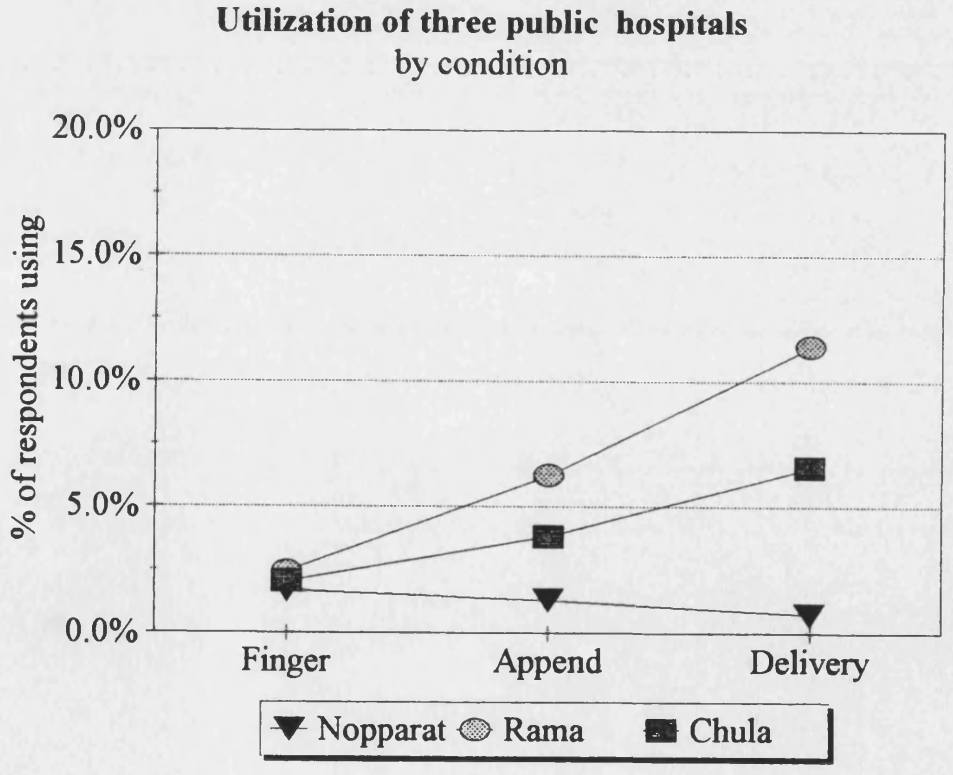
The stated choice of hospitals was explored by each of the three conditions given. It was clear that different individual hospitals had quite different patterns of selection (see Figure 7.1). Some private hospitals such as Ramkamhaeng, Mayo and Bangpho have a high frequency of attendances for the minor complaint of a cut finger but selection of these hospitals drops off steadily for appendectomy and delivery. Other private hospitals such as Phyathai and Bamroongrad exhibit quite a different pattern; their share of the market increases as the condition becomes more severe. Similar distinctions are evident in the group of public sector hospitals. Hospitals such as Wachira lose market share as the condition becomes more complicated whereas the university teaching hospitals (Ramathibodi, Siriraj and Chulalongkorn) gain.

The reasons given by consumers as to why a particular hospital was selected also varied across hospitals. Appendix 14 presents the total scores (for all three conditions) given to eight different hospitals. The main reason for choosing Ramkamhaeng or Mayo (which are both selected less as the condition becomes more severe) was easy access. For Bamroongrad and Phyathai skilled doctors are the most important reason for choice, although these hospitals also score well relative to most public sector hospitals in terms of comfort, equipment, promptness and sympathetic nursing staff. Amongst the public sector hospitals the reasons for choosing Wachira are strikingly similar to those for Ramkamhaeng and Mayo, except Wachira is also cheap. Rajavithi is viewed rather more like the university teaching hospitals, people often chose to use it because of the skilled doctors and equipment also gets a good rating. Respondents clearly had different perceptions about different hospitals and adapted their utilization behaviour accordingly.

Respondents claimed that access was the main consideration in selecting a hospital for both

Figure 7.1 - Patterns of choice of selected hospitals by condition





a cut finger and an appendicitis. In order to explore this further the location of selected hospitals was compared against respondents home address. Actual choice of hospital was found to reflect the priority which respondents gave to access (Table 7.17). Nearly one third of the sample chose a hospital in the district where they lived for the treatment of the cut finger. Only 15% chose a hospital in their residential district in which to deliver.

Table 7.17
Location of chosen hospital by condition

Location of hospital	Finger		Appendicitis		Delivery	
	N	%	N	%	N	%
In home district	240	32.1	187	22.3	79	14.9
Outside home district	529	68.8	651	77.7	452	85.1
Missing or outside Bangkok	444		357		452	

Cochran Q = 71.68
DF = 2
Significance = 0.000

Respondents' dependence upon their local hospital varied according to where they lived. For those in the central districts there is considerable choice of facility. However in some of the outlying districts of Bangkok choice is limited. Bangkapi district is a good illustration. Just over 10% of the respondents lived in Bangkapi district, yet at the time of the survey there were only three hospitals there, Ramkamhaeng (a big private hospital), Ladphrao (a relatively new private hospital) and Nopparat (a public hospital). As the district is located on the outskirts of Bangkok these hospitals had considerable geographical monopoly, particularly for less serious conditions. 62% of respondents living in Bangkapi said they would seek care for a cut finger at one of the three hospitals within the district (mainly Ramkamhaeng). 30.8% said they would seek maternity care within the district. Thus although the overall rate of people seeking care within the district is higher than for other districts it still declines with the seriousness of the condition. Over 90% of the respondents who said that they would use Ramkamhaeng hospital came from Bangkapi or one of the districts further to the east of the city which were also very badly served by hospitals.

By contrast hospitals in the centre, such as Phyathai and Ramathibodi are in close proximity

to other hospitals and have a very low degree of geographical monopoly. Consequently for minor conditions, such as a cut finger, where consumers' prime concern is easy access they were used infrequently. As the condition becomes more complicated, and consumers desire characteristics such as skilled doctors and good equipment, these hospitals attracted a higher share of the market by drawing in patients from throughout the city.

The pattern of complaints amongst those educated to degree level and those without a degree, and between those in lower and higher income groups[5] was examined. It was found that those who were educated to degree level or above were significantly more likely to have been dissatisfied with hospital services (Chi sq with Yates correction = 10.39, significance = 0.001); 52.8% of graduates had been dissatisfied compared to 42.6% of non-graduates. Moreover the nature of complaints by graduates and non-graduates differed. Graduates were more concerned about promptness than those without a degree; 41.3% of those who were dissatisfied with care amongst the graduates complained about promptness, compared to just 31.5% of those without a degree (Chi square with Yates correction = 4.33, significance 0.038). The more educated group was less concerned about the manner of hospital staff than the less educated group. 56.8% of those without a degree who complained did so about staff manner, compared to only 47.3% of graduates (Chi square with Yates correction = 3.88, significance 0.0489).

In terms of income a very similar proportion of the higher and lower income groups had been dissatisfied, but again there were discernible differences in the nature of their dissatisfaction. The pattern was very similar to that for education with higher income groups more concerned about promptness (although this result was not significant - Chi square with Yates correction 2.72, significance 0.099) and the lower income groups more concerned about manner of staff (Chi square with Yates correction = 5.58, significance 0.018). It is possible that these differences are due to wealthier, more educated people commanding more respect from staff and therefore being more politely treated, but also having higher opportunity costs.

[5] For the purposes of this analysis a respondent was classified as being in a lower income group if they had reported a monthly salary of less than B10,000. Although this would not be low by general Thai standards, this amount split the respondents to the survey evenly between high and low income groups.

7.6 HOSPITAL CHARACTERISTICS

What are the characteristics of different hospitals in Bangkok?

Although it was not a central aim of the consumer survey, some of the data collected, in particular that on advertising and complaints, shed light on the differentiating characteristics of hospitals in Bangkok and their marketing strategies.

Vertical product differentiation was to some extent reflected in advertising strategies. More expensive and prestigious hospitals, such as Phyathai and Bamroongrad hope to draw clientele from a large market area. They made considerable use of television for advertising (Table 7.18). The respondents recalling these advertisements were more widely spread throughout the city than those recalling advertisements for the less prestigious hospitals (such as Ladphrao and Pharam 9) which used mainly billboards for advertising.

Respondents frequently recalled hospital advertisements for special services. For example Bamroongrad had been advertising its health promotion programme and surgery facilities for myopia, Kluay Namthai had been promoting itself as a carer for the elderly, Krungthep hospital had been advertising its cardiac unit, Theptarin its thyroid and diabetes centre, Pharam 9 its infertility clinic and Phyathai its HIV and Hepatitis B screening service. Special offers were also touted; Pharam 9 was offering free dental care services and Krungthep hospital was offering its clients vouchers giving discounts on various leisure activities including hotels at holiday resorts.

Personal recommendations by famous people or use of the facility in well-publicized circumstances were also capitalized upon. Phyathai had been using the personal endorsement of Dr Athit, its owner (and subsequently the Minister of Health), to promote its services. Paolo Memorial hospital claimed that it was used 'by film stars' and Kluay Namthai advertised the fact that it had treated the victims of a recent traffic accident. Further publicity was also gained by Pharam 9 and Phyathai through the sponsoring of TV programmes, Pharam 9 even had its own 'mini-series'.

Table 7.18
Recall of individual hospital advertisements by media type and residential district of respondent[6]

	Pharam 9	Phyathai	Kluay Namthai	BMG	Ladphrao
Media Type					
Radio	25.0%	25.0%	52.2%	30.0%	16.7%
Television	25.0%	43.8%	21.7%	60.0%	27.8%
Newspaper	65.6%	43.8%	52.2%	45.0%	55.6%
Billboard	45.3%	34.4%	39.1%	35.0%	72.6%
N	64	32	23	20	18
Residential district					
Same as hospital	16.9%	23.1%[7]	10.3%	4%	28%
Neighbouring	27.7%	5.1%	24.1%	28%	52%
Elsewhere	55.4%	71.8%	65.5%	68%	20%
N	65	39	29	25	25

Insights into the differences between hospitals can also be gained from the types of complaints made about different hospitals. Appendix 15 shows the nature of respondents' dissatisfaction with care received. The most common complaints by the group as a whole were (i) slow (ii) long queue (iii) poor service (iv) rude and (v) apathetic. If public and private hospitals are analyzed separately then this ranking held true for public hospitals but for private hospitals it differed slightly as the price of care was the second most commonly cited concern. It is also

[6]The percentages in the columns for media type sum to more than 100% as frequently respondents recalled more than one media type where they had seen or heard an advertisement for that particular hospital.

[7] Advertisements appear not to distinguish between Phyathai 1 hospital and Phyathai 2 hospitals which are in different but neighbouring districts. Hence the probability of a respondent living in the same district as the hospital is doubled.

interesting to note that complaints about 'wrong diagnosis', 'poor examination' and 'incompetence' were all higher in the private sector. There were several complaints in public hospitals about unfair or discriminatory treatment whereby certain patients queue jumped or received preferential care.

7.7 SUMMARY

The focus of this chapter has been consumer behaviour and consumer search activity for health care in Bangkok. In particular we have sought to establish:

- the characteristics which consumers seek in hospital care;
- how well informed consumers are about the hospital market;
- the type of search behaviour which consumers undertake;
- the extent of 'consumerist' activity in the market;
- how consumer knowledge affects utilization behaviour.

The main characteristics which consumers sought in hospital care were found to be easy access, skilled doctors, prompt service and good equipment. Many respondents gave some importance to a reasonable price, but price was certainly not one of the key factors in choosing hospitals. Little difference in the reasons given for choosing public or private hospitals was found, except for price: some respondents said that they would choose a public hospital because of the reasonable price, whereas very few gave this as a reason for choosing a private hospital.

The reasons given for selecting a hospital varied with the condition for which care was sought and also with the particular hospital chosen. For minor conditions and for emergency care, access was perceived to be a very important factor in choice. For a normal delivery greater emphasis was placed on the clinical quality of care (doctors skills, equipment etc). For some of the hospitals more commonly selected it was possible to identify particular reasons for choosing that hospital. It appeared that whilst certain hospitals in both public and private sectors were chosen because of the perceived high quality of clinical care, others tended to be chosen because they were easy to access. This was supported by the stated utilization patterns of respondents. Hospitals such as Ramkamhaeng were found to be used mainly by local residents for more minor conditions. Utilization of such hospitals dropped off for cases requiring more complex care.

Middle class consumers in Bangkok appear to have extensive experience and considerable knowledge of the private hospital care sector. Most respondents were able to identify the most expensive, most comfortable and best equipped facilities out of fifteen hospitals listed. Respondents appeared less well informed about facilities at the bottom end of the market.

Three main dimensions of consumerism were considered: information seeking behaviour, quality and price sensitivity and independence from medical advice. Respondents were aware of the substantial amount of advertising activity undertaken by private hospitals. However the limited evidence available from this survey suggests that advertising information played a minimal role in explicitly shaping consumer opinions. More important was advice from known individuals. Three quarters of respondents had sought such advice on at least one occasion and their preferred source of information was friends and relatives over health care professionals.

Price sensitivity appeared fairly limited, even in the private sector. Only one third of respondents said they would ask about the price before being treated in a private hospital. Of the respondents who said they regularly used a private hospital only one third said that they would switch hospitals if their regular hospital increased its prices by 50%. This lack of price sensitivity is probably, at least partially, the result of more widespread insurance amongst the respondents than was anticipated. Over 96% of respondents said they had some form of health insurance or medical benefit scheme. The surprising factor here was the high level of employer insurance (31.4% of the sample) which was not anticipated at the outset of the study (although other studies in Thailand have since confirmed this result). Private health insurance was also quite high, covering 18.3% of the sample.

On the whole respondents appeared reluctant to complain if they received a poor quality of care. Again differences between public and private sectors were evident; respondents were more likely to complain in the private sector if they were unhappy with care (25% did so compared to 14% in the public sector). This difference persisted regardless of the nature of the problem. Although unlikely to complain about care received respondents were happy to seek a second opinion. Indeed nearly 40% of the sample said that they had done this on at least one occasion.

CHAPTER 8
THE FORM OF HOSPITAL COMPETITION

8.0 INTRODUCTION

This chapter investigates the form of hospital competition prevailing in Bangkok. In particular it:-

- assesses how simple measures of market concentration affect (a) prices, (b) quality of care, (c) profitability and (d) service intensity (objective viii);
- analyses the nature of competition between hospitals, particularly the extent of price competition vis a vis quality competition and supplier induced demand (objective ix).

Table 8.1 reproduces the anticipated effects of different forms of competition in the health care sector. This table guided the analysis in this chapter

Table 8.1
The effect predicted by different models of a decrease in market concentration

Variable \ Model	Traditional model	Induced demand	Quality Competition	Increasing Monopoly
Fees/price	-			+
Provider income	-			+
Quality			+	
Service intensity		+		

Key: - decrease in variable
+ increase in variable
blank space indicates no impact or unclear impact

Source: Adapted from Reinhardt 1978.

A chain of interlinked questions was pursued. First, the existence of price competition was explored. If low levels of competition (ie. highly concentrated markets) were seen to be associated with high prices, and vice versa, then this would suggest that price competition was dominant. If on the other hand there was no association or a positive association between level of competition and price then alternative forms of competition need to be explored.

Of the three alternative models considered it was difficult to test the increasing monopoly model directly. Instead this was seen as a 'residual' model which may be applicable if there was no evidence of quality competition or supplier induced demand. Quality competition was first tested for directly; were higher levels of competition associated with high quality indicators? Secondly the relationship between competition measures and quality adjusted prices was examined; if quality competition was the principal form of competition in the market, then once quality had been adjusted for there should be little evidence of any relationship between price and competition indicators.

Supplier induced demand was also tested for using two different methods. First there was direct investigation of the relationship between measures of service intensity and competition. Second evidence of a link between item specific price, in particular room charge, and competition was examined on the basis that if supplier induced demand was dominant then although the overall price of care may increase with competition there would not be a relationship between item specific prices and competition.

The principal form of analysis used in the Chapter is correlation analysis supported by scatter plots of the variables (see Appendix 16 for scatter plots), and ordinary least squares regression analysis. A key shortcoming of correlation analysis is that it may fail to detect an association between variables if this is non-linear in form. Furthermore one or two extreme observations may significantly affect the value of the correlation coefficient. The scatter plots were used therefore to check for both non-linear relationships and outliers. It was suggested in Chapter 2 that one of the problems in analysing competition in hospital markets was the potential for several models of competition to prevail simultaneously, and the over-lapping, often unspecific, nature of the predictions of the different models. The analysis carried out here was exploratory rather than conclusive in nature, but allowed for the existence of more than one form of competition in the market.

Two new bodies of data are introduced in this chapter. Firstly a set of competition (or concentration) measures were computed. These measures were based upon the hospital mapping. Secondly, financial data collected from company accounts, including hospital company profitability, and asset and expenditure measures, were used. These two data sets are briefly

reviewed before presenting the main analysis of competition.

8.1 COMPETITION MEASURES

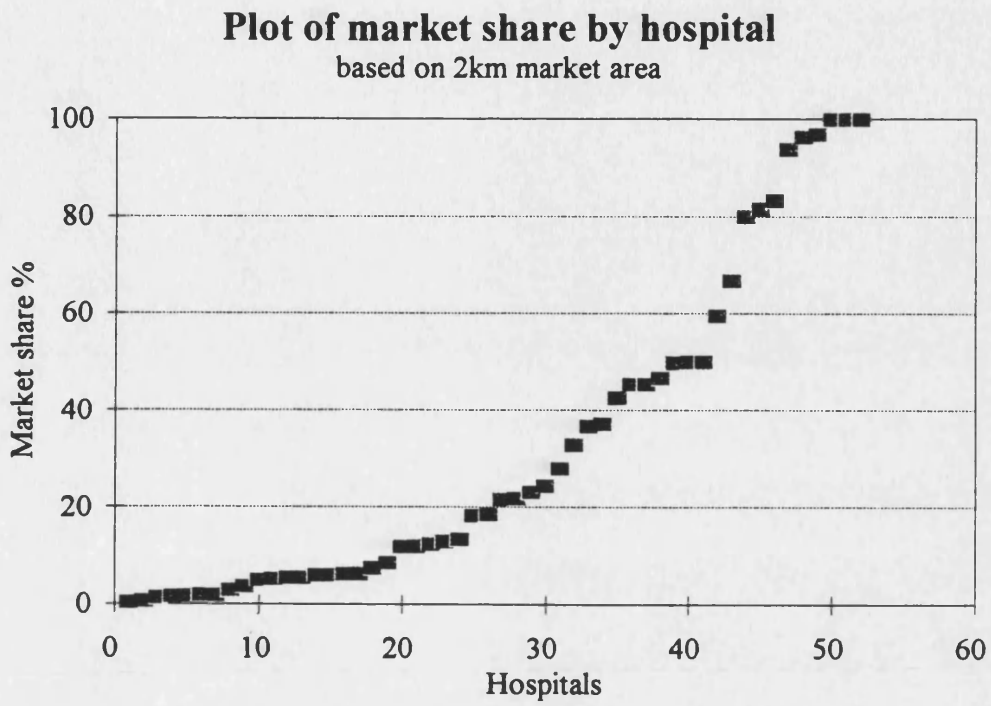
As described in Chapter 5 three types of competition measure were used. The first (COMP2 and COMP5) was based upon a simple count of the number of competing hospitals within a certain radius. The second (BEDCOMP2 and BEDCOMP5) measured the share of total beds that the hospital of focus had in its market. The third (HHI2 and HHI5) was the Hirschman-Herfindahl index based upon the squared shares of each hospital in the market summed across the market. This latter type of concentration measure is the most sophisticated; it reflects both the number of firms in the market and the degree of inequality in firm sizes. According to oligopoly theory both of these factors will affect market power. The first (COMP) measure only relates to the number of firms in the market, whereas the second (BEDCOMP) measure only relates to the relative size of the hospital under consideration.

Two different radii around the hospital were used to define the market area; one of two kilometres (COMP2) and one of five kilometres (COMP5). The values of the competition measures for the hospitals in the analysis are given in Appendix 17.

Figures 8.1 and 8.2 plot the market share of different hospitals (BEDCOMP) and the Hirschman-Herfindahl index (HHI) measures for the set of hospitals. The HHI plots also demarcate the level where the index is equal to 0.18, the US Department of Justice uses this level to identify highly concentrated markets (Robinson et al 1991).

Naturally concentration appears to be significantly less if the 5 kilometre rather than the 2 kilometre measure is used to define the market. Only seven out of the fifty-two hospitals considered had more than a 20% share of the market using a five kilometre market radius. Fifteen of the hospitals (approximately 29%) were situated in markets with an HHI greater than 0.18.

Figure 8.1
Scatter plots of market share by hospital



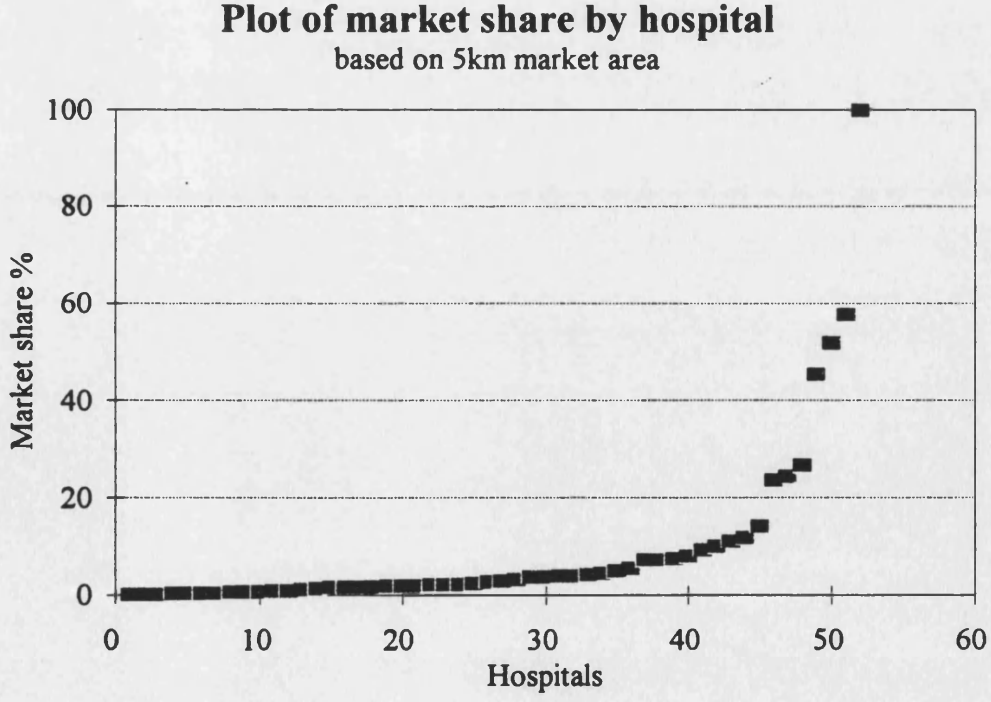
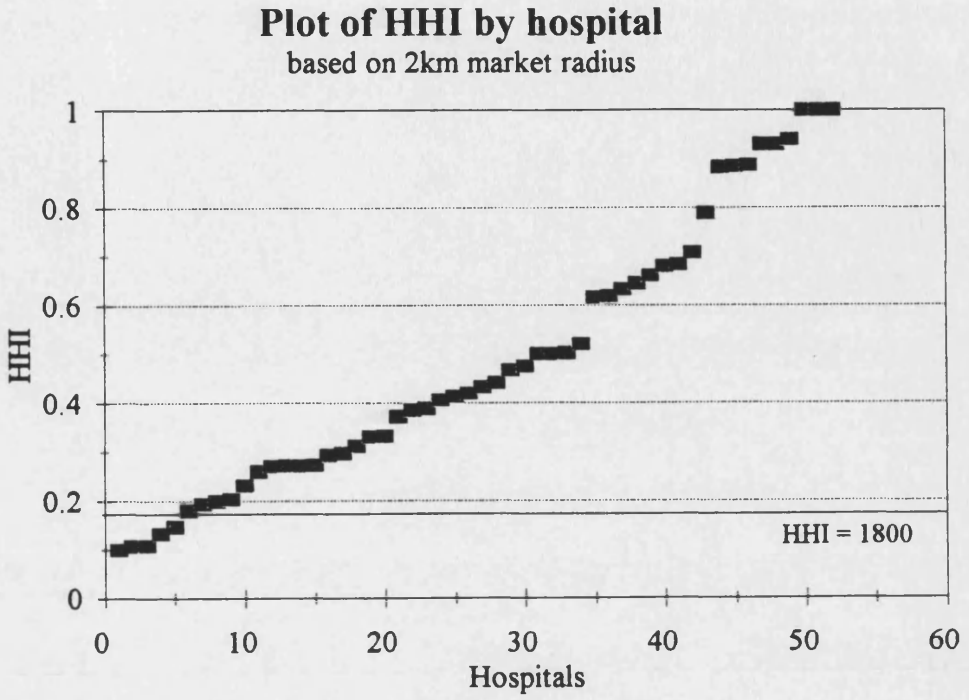
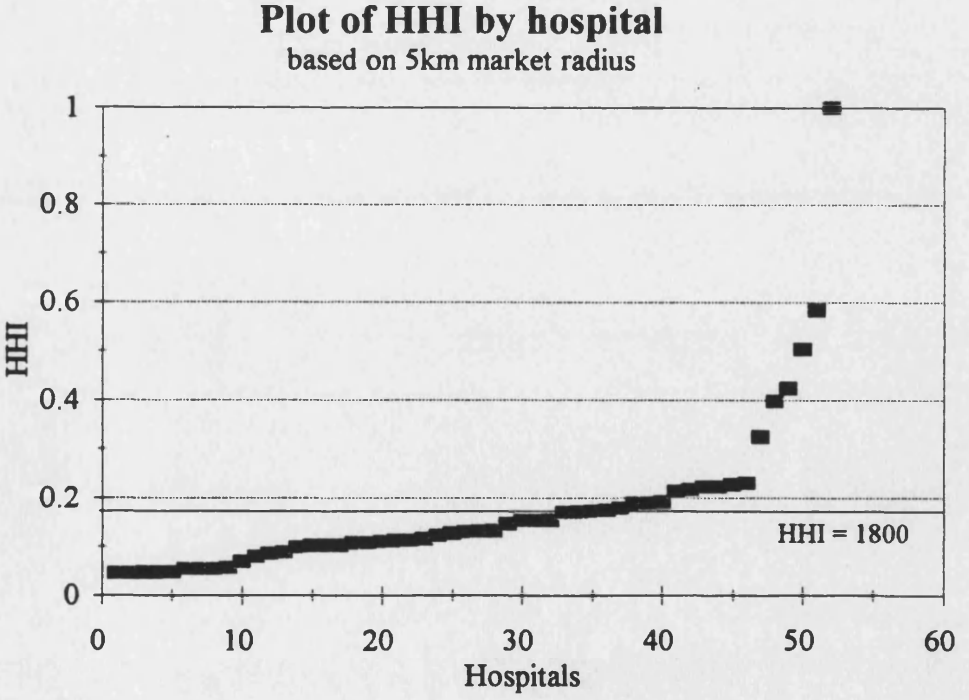


Figure 8.2
Scatter plots of Hirschman-Herfindahl indices by hospital





8.2 FINANCIAL DATA

Data for thirty of the main hospital companies were collected from the Ministry of Commerce[1]. A number of approaches were used in order to check the reliability of the data:-

i. Various accounting identities were checked; this process found that some companies presented profit data before tax and others after tax. As a few hospitals were exempted from tax by the Board of Investment it was decided to use pre-tax profits in all cases.

ii. The data were checked against other sources, notably Pianpaktr 1993. The analysis by Pianpaktr covers only Stock Exchange of Thailand (SET) listed companies, but was compiled with the support of the companies concerned and with data provided directly by them. The financial data in Pianpaktr exactly matched the hospital accounts retrieved from the Ministry of Commerce.

iii. Advisors including a lecturer in accounting at one of the Thai universities, a financial advisor to one of the Thai banks and a private hospital director reviewed the data.

As a result of these approaches two of the records were excluded from the analysis. One very clearly under-recorded hospital revenue, the other presented data for a hospital which had only been open for part of the year. The other records were felt to be reasonably reliable.

Table 8.2 presents basic financial data for the hospitals and selected ratios including expenditure per bed, profit margin and return on assets. Considerable variation is evident in the various ratios calculated. For example expenditure per bed varies from a low of 87 thousand Baht per annum at Saenvejchakan Hospital to a high of just over 3 million Baht per annum at Samitivej Hospital. These differences are expected given the very different characteristics of hospitals in the sample.

Average profit margin or profitability in the sample was about 11% and average return on assets was about 12%. Cleverly (1992) defines a high return on assets for hospitals in the US to be more than 9.2% per annum and a low return on assets to be less than 1.05% per annum. If this definition were to be used in Thailand then more than 60% of the hospitals in the sample have a high return on assets and only 10% have a low return on assets.

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[1] It should be noted that the set of hospitals for which financial data were collected do not exactly match those hospitals used in the analysis of Chapter 6. The hospitals on which financial data were accessed tended to be the larger ones.

Table 8.2
Basic financial data by hospital

Hospital name	Bed Number	Total assets	Total revenue	Liquidity	Gearing	Profit Margin	Return on Assets	Expenditure per bed	Assets per bed
SUKSAWAT POLYCLINIC	8	2,176,505	2,147,086	1.39	24.24%	8.08%	7.97%	246,696	272,063
ROMSAI POLYCLINIC	10	1,651,859	1,857,778	4.22	17.90%	4.85%	5.45%	1,192,070	165,186
LADKABUNG HOSPITAL	25	6,841,186	5,828,186	1.57	10.15%	11.41%	9.70%	206,595	273,647
BANGBORN HOSPITAL	26	1,599,689	4,372,225	n/a	68.76%	1.92%	5.24%	164,938	61,527
SAENAVEJCHAKAN HOSPITAI	27	29,957,507	2,450,632	18.65	0.05%	4.13%	0.34%	87,011	1,109,537
YANHII POLYCLINIC	28	3,947,393	5,137,462	0.60	72.69%	3.64%	4.74%	176,795	140,978
PASICHALOEN HOSPITAL	30	809,823	2,376,070	n/a	95.02%	15.57%	45.69%	67,202	26,994
YAOWARAK HOSPITAL	40	5,534,369	11,652,486	n/a	0.55%	1.63%	3.44%	286,551	138,359
RATBURANA HOSPITAL	50	29,105,892	34,994,265	2.50	17.28%	14.26%	17.15%	600,052	582,118
PROMMITR HOSPITAL	80	92,479,837	76,181,134	1.50	51.14%	20.63%	15.72%	770,561	1,155,998
BANGPHOO HOSPITAL	100	195,793,352	124,401,840	1.05	52.81%	20.19%	12.65%	996,346	1,957,934
DECHA HOSPITAL	100	174,914,123	53,533,857	0.29	86.59%	-40.12%	-12.27%	749,946	1,749,141
PETCHAVEJ HOSPITAL	100	65,609,051	132,850,990	0.11	67.89%	18.59%	36.38%	1,089,802	656,091
KARUNA PHITAK HOSPITAL	100	41,608,194	37,340,281	0.25	61.39%	-14.29%	-12.82%	426,763	416,082
BANGMOD HOSPITAL	100	32,068,841	57,583,452	1.42	64.78%	5.43%	9.76%	544,544	320,688
KASEMRAD HOSPITAL	100	86,652,000	43,032,000	0.88	78.59%	5.39%	2.66%	278,050	866,520
KRUNGHDON HOSPITAL	130	255,603,788	220,309,763	5.13	9.15%	25.48%	21.96%	1,275,946	1,966,183
WIPAWADI HOSPITAL	175	508,479,147	287,072,748	0.98	39.50%	14.83%	8.17%	1,403,133	2,905,595
SAMITIVEJ HOSPITAL	200	955,831,229	764,842,873	0.11	39.49%	20.77%	16.06%	3,056,790	4,779,156
MAYO HOSPITAL	200	160,804,793	247,943,602	1.37	62.43%	10.61%	16.24%	1,109,129	804,024
BAMROONGRAJ HOSPITAL	256	1,273,878,653	892,906,821	0.13	41.49%	28.20%	19.75%	2,504,896	4,976,088
SIAM HOSPITAL	266	93,785,583	120,339,029	0.92	27.63%	16.10%	19.19%	384,743	352,577
PAOLO MEMORIAL HOSPITAL	300	59,158,217	282,508,244	0.14	100.00%	-1.81%	-8.63%	876,950	197,194
RAMKAMHAENG HOSPITAL	315	782,352,804	426,823,451	0.30	44.22%	21.45%	11.66%	1,065,294	2,483,660
PHYATHAI 2	350	821,851,000	688,847,000	0.69	46.41%	24.79%	20.23%	1,493,023	2,348,146
PHYATHAI 1	350	768,304,740	727,147,772	1.15	25.59%	27.94%	23.49%	1,546,302	2,195,156
BANGKOK HOSPITAL	403	631,237,000	697,026,000	0.48	25.26%	20.94%	22.03%	1,384,491	1,566,345
THONBURI HOSPITAL	435	1,075,545,000	712,784,390	0.39	52.25%	18.46%	12.23%	1,336,180	2,472,517

Definitions
Gearing = external borrowing/total capital
Liquidity, current ratio = current assets/current liabilities

8.3 PRICE COMPETITION

Is there any evidence of negative association between measures of the intensity of competition and price per case suggesting that price competition is prevalent in the market place?

Table 8.3 shows the simple Pearson r^2 correlation coefficient between the different measures of competition and the inpatient price index. The level of significance for a two-tailed test are shown in brackets. Only the coefficient on the COMP2 indicator is significant (at the 2% level) but the signs of the coefficient all suggest the same picture ie. that higher levels of competition are associated with higher prices. The negative sign on the BEDCOMP indicators suggests that as a hospital's share of the local market increases then prices are likely to be lower.

Table 8.3

Correlation coefficients between competition and inpatient price index

	COMP2	COMP5	BED-COMP2	BED-COMP5	HHI2	HHI5
IPINDEX	0.443 (0.013)	0.249 (0.177)	-0.101 (0.591)	-0.066 (0.726)	-0.147 (0.430)	-0.197 (0.288)

Notes: 2 tailed significance levels shown in brackets
N= 31

The results indicated in table 8.3 were supported by a consideration of the price charged for a normal delivery and competition measures, although none of the correlation coefficients were significant at the 10% level. Correlation coefficients on acute appendicitis did not yield any clear pattern.

In conclusion there was no negative correlation between measures of the intensity of competition and price. This suggests that price competition was not present, or at least was not the dominant form of competition, in the market. The analysis indicated that there may be a positive association between intensity of competition and price per case.

8.4 QUALITY COMPETITION

Is there any evidence of positive correlation between competition measures and quality indicators suggesting that quality competition is prevalent in the market place?

Two separate sets of data were used to explore this question. First the financial data collected from the hospital accounts were used to explore the links between financial measures of input (specifically expenditure per bed and assets per bed) and competition. Second the indicators of structural quality (previously used in the hedonic price analysis), specifically, the percentage of private beds, the beds per doctor and per nurse and the equipment profile of the hospital were investigated. The correlation coefficients between these variables and the competition indicators are presented in table 8.4

Table 8.4
Correlation coefficients between competition measures and quality measures.

	COMP2	COMP5	BED-COMP2	BED-COMP5	HHI2	HHI5	N
EXP PER BED	0.417 (0.014)	0.462 (0.007)	-0.238 (0.112)	-0.137 (0.243)	-0.445 (0.009)	-0.322 (0.047)	28
ASSETS PER BED	0.427 (0.012)	0.415 (0.014)	-0.229 (0.121)	-0.036 (0.429)	-0.337 (0.040)	-0.238 (0.112)	28
PERCPRI	0.106 (0.260)	0.101 (0.271)	0.199 (0.113)	-0.032 (0.424)	-0.110 (0.250)	-0.091 (0.288)	39
BEDWDR	0.125 (0.223)	0.127 (0.221)	-0.045 (0.392)	0.036 (0.414)	-0.172 (0.144)	-0.105 (0.260)	39
BEDW-NUR	-0.143 (0.193)	-0.093 (0.287)	-0.215 (0.094)	-0.144 (0.191)	-0.002 (0.496)	-0.077 (0.318)	39
SUM-QUIP	-0.004 (0.490)	-0.080 (0.314)	0.396 (0.006)	0.447 (0.002)	0.079 (0.314)	0.254 (0.057)	39

Notes:
One-tailed significance levels shown in brackets.

In the upper part of the table there appears to be a clear and significant positive correlation between the COMP indicators and expenditure per bed and assets per bed, and a clear and

significant negative correlation between the HHI indicators and expenditure per bed and assets per bed, suggesting that when competition is higher, hospitals are forced to invest more in facilities and other inputs. This finding however should be interpreted cautiously. Most of the hospitals which face a high degree of competition are in the centre of the town where property prices are high and thus assets per bed are also likely to be high. This effect may filter through to expenditure per bed, as depreciation would form one, albeit small, element of expenditure.

No clear pattern emerges amongst the correlation coefficients in the lower part of the table, where specific measures of quality were investigated. Only the relationship between equipment profile and the BEDCOMP and HHI indicators appear to be significant. It is probable that the significant correlation coefficients here are picking up on the strong positive correlation between the market share and size of a hospital, and the number of items of equipment it possesses.

Thus although the asset per bed and expenditure per bed indicators do suggest the presence of quality competition amongst hospitals in Bangkok, the evidence presented so far is not overwhelming.

If quality competition was the dominant form of competition in the market place then there would be little difference between the observed price and quality adjusted price. If quality competition was not dominant but some other form of non-price competition was, then we would expect there to be a sizeable difference between actual price and quality adjusted price which could be explained (at least partially) by variation in market concentration. Using the hedonic price regression analysis of Chapter 6, specifically model 2 of Table 6.12, quality adjusted prices were estimated (Cowling and Cubbin 1971). Quality adjusted price is essentially the predicted price of care at a hospital, given its characteristics and the parameters established by the hedonic price equation.

Thus quality adjusted price (P') was given by:

$$P' = 63.47 + 90.86(\text{PRESTIGE}) - 9.38\ (\text{BEDWDR}) + 55.46\ (\text{PERCPRI}) + 18.08\ (\text{SUMEQUIP})$$

and hence the difference (D) between quality adjusted prices and actual price:

$D = P - P'$

It was hypothesized that (D) can be explained by market conditions, specifically competition and hospital ownership ie.

D = f(competition indicators, NFP, SET)

Where NFP is a dummy variable which is equal to one if the hospital is owned and operated by a non-profit organization and zero otherwise, and SET is another dummy variable equal to one if the hospital is quoted on the stock exchange and equal to zero otherwise. Table 8.5 shows the results of several ordinary least squares regression analyses including different sets of variables in the model.

None of the models estimated succeed in explaining a high proportion of the difference between the estimated quality adjusted price and the actual price, suggesting that the market for hospital services in Bangkok will bear significant, unjustified price variation. However, when included singly each of the competition variables was significant[2]. The COMP2 and the HHI2 indicators of competition offer slightly better fit and higher levels of significance than the other measures of competition. Moreover the COMP variable coefficient was found to have a consistently positive sign and the BEDCOMP and HHI variables a consistently negative sign. This implies that even after quality factors are taken into account, prices are higher in hospitals which face greater competition. This finding further refutes the presence of price competition in the market and suggests that the increasing monopoly model and/or the supplier induced demand model may offer insights into the nature of hospital competition in Bangkok.

Equations (1)-(7) in Table 8.5 are also interesting due to the light which they shed on how hospital ownership affects pricing. The coefficient on the NFP dummy variable was not

[2] A high degree of multicollinearity between the competition variables probably explains why neither was found to be significant when more than one was included in the model.

significantly different from zero in any of the models estimated, implying that once quality of care has been taken into account, non-profit hospitals do not charge significantly more or less than for-profit hospitals. On the other hand the coefficient on the stock exchange variable was consistently highly significant and strongly positive suggesting that privately owned hospitals on the stock market tend to charge considerably higher prices than is warranted by the quality of care which they provide.

Table 8.5
Equations explaining difference between quality adjusted price and actual price

	1 D	2 D	3 D	4 D	5 D	6 D	7 D
COMP2	1.422 (1.772)	2.496*** (0.991)	-	-	-	-	-
COMP5	0.418 (0.573)	-	0.696*** (0.280)	-	-	-	-
BED-COMP2	-	-	-	-0.369** (0.161)	-	-	-
BED-COMP5	-	-	-	-	-0.525** (0.243)	-	-
HHI2	-	-	-	-	-	-48.92*** (18.89)	-
HHI5	-	-	-	-	-	-	-54.54** (25.98)
SET	31.20** (13.18)	31.52*** (12.74)	30.66*** (12.73)	32.72*** (13.06)	32.62*** (13.19)	28.57*** (12.55)	27.73** (12.99)
NFP	-3.69 (19.54)	-	-	-	-	-	-
CONSTANT	-23.08** (10.29)	-18.37** (7.52)	23.24*** (9.13)	7.99 (7.46)	0.378 (5.64)	16.28* (9.43)	5.23 (0.754)
Adj R^2	0.188	0.229	0.226	0.204	0.190	0.237	0.183
F	2.734	5.46	5.37	4.83	4.51	5.67	4.36
Sign	0.05	0.099	0.011	0.016	0.020	0.009	0.022
N	33	33	33	33	33	33	33

Notes: standard errors in brackets
significance levels: *** 2% level ** 5% level * 10% level

If higher prices in more competitive areas are not entirely due to higher quality then it is possible that profitability is also higher in such areas. Using the data taken from company accounts simple correlation coefficients between the two measures of profitability (PROFMARG and ASSRETURN) and the various competition measures were calculated. These failed to reveal any significant correlation. However inspection of a scatter plot of the data (figure 8.3) suggested that there was one extreme outlier, Decha hospital, which had made highly negative profits during the year under consideration (profit margin = -40.12 and return on assets = -12.82). If this one hospital was excluded from the analysis a significant pattern emerged as shown in Table 8.6. Again the COMP2 and HHI2 indicators yielded stronger results than the other indicators of competition used.

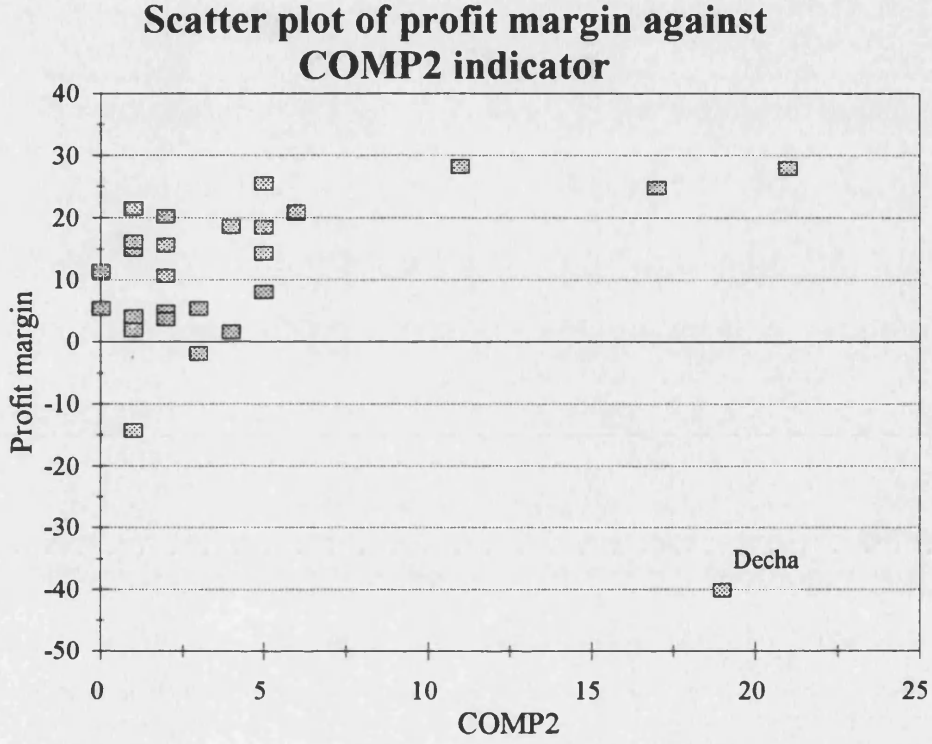
Table 8.6

Correlation between competition measures and profitability measures in hospitals

	PROFMARG	ASSRETURN
COMP2	0.577 (0.001)	0.333 (0.045)
COMP5	0.307 (0.059)	0.121 (0.274)
BEDCOMP2	-0.256 (0.099)	-0.235 (0.119)
BEDCOMP5	0.091 (0.325)	-0.002 (0.496)
HHI2	-0.427 (0.013)	-0.422 (0.014)
HHI5	-0.089 (0.330)	-0.112 (0.289)

Notes:
One tailed significance levels shown in brackets
N= 27

It is unclear why Decha constituted such an extreme outlier. The hospital faces very high competition and if the financial data are to be believed, is doing very badly. Decha was also noted


Scatter plot of profit margin against COMP2 indicator
Profit margin
40
30
20
10
0
-10
-20
-30
-40
-50
0
5
10
15
20
25
COMP2
Decha

to be an outlier in the computation of the inpatient price index (see section 6.3). Some other hospitals in Bangkok appear also to have made heavy losses due principally to a combination of high capital costs and very low utilization rates. Unfortunately occupancy data for Decha were not available.

The previous analysis of quality adjusted prices suggested that competition was not the only factor affecting the difference between actual price and predicted price. Ownership was also significant. In order to explore the impact of both the competition variables and ownership variables on profitability, regression analysis was carried out. Decha Hospital was excluded from the analysis as it appeared to be such an extreme outlier and there may be questions about the reliability of the financial data. There is considerable disagreement about the appropriate functional form of profit functions (Waterson 1983) thus various forms were experimented with. The plot of PROFMARG against COMP2 (Figure 8.3) suggested that the relationship may not be a linear one, and indeed the semilog form of the equation worked best. Table 8.7 shows the results of the regressions. A substantial amount of variation in PROFMARG appears to be explained by the COMP2 and SET variables, with stock exchange hospitals trading in more competitive areas likely to make substantially higher profits than other hospitals. Neither the BEDCOMP nor the HHI variables were found to be significant even when they were the only competition variable included in the analysis, however the estimated coefficients on these variables were consistently negative. The use of ASSRETURN as the dependent variable also yielded weak results. It is possible that the methodology used in Thailand for valuing assets for company accounts is not entirely reliable, in turn implying that the denominator of the ASSRETURN variable was unreliable.

Broadly speaking this investigation of profitability confirms the previous analysis of predicted quality adjusted prices and actual prices; hospitals located in more competitive markets are more profitable, and stock exchange ownership also increases profitability. According to Table 8.1 increased profitability with a higher degree of competition is a direct prediction of the increasing monopoly model. However it is not inconsistent with supplier induced demand, to the extent that increased service intensity increases revenues more than costs.

Table 8.7
Regression analyses explaining variations in profitability

	(1) PROFMARG	(2) PROFMARG	(3) LN(PROFMAR)	(4) ASSRETURN
COMP2	1.136*** (0.294)	-	34.13*** (5.32)	0.794 (0.470)
COMP5	-	0.156 (0.112)	-	-
SET	10.61*** (3.41)	10.73*** (4.22)	267.23*** (61.74)	4.17 (5.46)
CONST	5.65** (2.01)	6.76** (3.25)	61.19 (36.45)	8.46*** (3.22)
Adj R^2	0.485	0.230	0.706	0.060
F	13.24	4.82	32.15	1.82
sig	0.0001	0.017	0.0000	0.183
N	27	27	27	27

Notes: standard errors in brackets
significance levels: *** 2% level ** 5% level * 10% level

8.5 SUPPLIER INDUCED DEMAND

Two approaches were used to investigate the presence of supplier induced demand in the market place. The first investigated the existence of a relationship between the measures of competition and the price for a particular service (room charge). It is argued that if supplier induced demand was present, then although the overall price per case may increase with competition, there would not be a link between individual fees and competition measures. Secondly the relationship between service intensity and competition was investigated directly.

Is there any evidence of positive or negative correlation between the competition measures and the room charge?

Table 8.8 shows the simple Pearson correlation coefficients between room charge and the competition measures. None of the correlation coefficients are significant and the signs on the BEDCOMP variables are inconsistent with those on the COMP and HHI variables. Therefore we

must reject the hypothesis that there is any relationship between competition and room charge. This suggests that the relationship between overall price and competition could be due to higher service intensity in hospitals in more competitive areas. However this conclusion should be treated with caution. As pointed out in Chapter 5 it has been suggested that price competition may be observed in the amount charged for the room, as this is a relatively easy variable for consumers to observe (Davis 1972). If there were price competition in room charge then this may offset a quality related increment.

Table 8.8

Correlation between room charge and competition indicators

	COMP2	COMP5	BED-COMP2	BED-COMP5	HHI2	HHI5
ROOMCHG	0.218 (0.23)	0.199 (0.27)	0.172 (0.35)	0.057 (0.76)	-0.129 (0.484)	-0.027 (0.886)

Notes: two tailed significance levels in brackets
N = 32

Is there any evidence of a positive relationship between service intensity and competition?

There are a number of aspects of health care services which could be manipulated by physicians or hospital managers in response to increased competition. Given data availability this study focused upon investigation rates, admission rates and length of stay. However there are some shortcomings with these measures.

Discussions with hospital managers indicated that the majority of physicians employed by private hospitals receive as payment a percentage of the doctor's fee charged to the patient. Sometimes they also receive a salary Thus for doctors employed by a private hospital there is no financial incentive to order more investigations or prescribe more drugs. Some smaller facilities are physician owned and operated; in such cases as the physician's income relates to the profit of the facility there is a direct financial incentive to prescribe extra tests and drugs. Moreover there is also a possibility that managers can influence investigation rates through, for example, putting subtle pressure on physicians to order investigations or prescribe expensive drugs.

Using data collected from the Civil Servants' Medical Benefit Scheme two measures were computed. STANDINV measures the percentage of the total bill covering standard investigations such as laboratory tests, X-rays etc. ALLINV measures the percentage of the total bill going on any investigations including the standard investigations and special investigations such as CT scans, ultrasound, EKG etc. The mean value of STANDINV was approximately 9.0% with a range of 2-16% and the mean value of ALLINV was about 11.3% with a range of 2-27%.

There are a number of variables which even physicians working as hospital 'employees' can influence which will affect their income. These include the number of repeat visits, admission rates and length of stay. Unfortunately some of the throughput data provided by hospitals under the private hospital census was thought rather unreliable. From the census of private hospitals the average length of stay at each hospital during 1992 and admission rates[3] for 1990, 1991 and 1992 were explored. Data on number of re-attendances were not available. Data on length of stay were thought to be most unreliable because although hospitals appeared to record the number of admissions, the number of hospital days was less likely to be recorded.

The results for correlations examining the percentage of the bill going to investigations were confusing; although some were just significant at the 5% level, the signs were inconsistent. The correlation coefficient on the admission rate and length of stay variables were consistent and significant, however inspection of the scatter plots (see Appendix 16) found that in each case there was one extreme outlier. For length of stay this was Kwong Sui, a small non-profit hospital, which we know from the cluster analysis has quite different characteristics to many hospitals in the market. Excluding Kwong Sui from the correlation analysis rendered the results on length of stay insignificant. For admission rate the outlier was Phyathai 2. There was no reason to doubt the reliability of the data from Phyathai 2 nor to believe that it is fundamentally different from other hospitals in the market. However, even if this observation was excluded, the results on admission rates were still fairly strong and significant. Although evidence on length of stay was unclear, it appears that admission rates were significantly higher at those hospitals facing greater competition.

[3] Admission rate = number of inpatient cases/number of outpatient attendances.

Taken at face value these results would suggest that at least in some respects supplier induced demand is a problem in the market, with hospitals facing higher competition artificially increasing service intensity. However there is an equally plausible explanation for the results found here. In the previous chapter it was observed that for simple conditions people would tend to use their local hospital, but for more severe conditions they would be more likely to travel into the centre of Bangkok to seek care. The data presented above do not allow for differences in case-mix or severity between the hospitals and thus may be misleading. Unfortunately assessing service intensity whilst controlling for case-mix would require special primary data collection.

Table 8.9
Correlation coefficients between service intensity variables and competition measures

VBL	COMP2	COMP5	BED-COMP2	BED-COMP5	HHI2	HHI5	N
LOS	0.560 (0.019)	0.424 (0.090)	-0.292 (0.255)	-0.128 (0.625)	-0.349 (0.170)	-0.371 (0.142)	17
ADRATE90	0.623 (0.000)	0.368 (0.050)	-0.091 (0.640)	-0.045 (0.818)	-0.424 (0.022)	-0.333 (0.780)	29
ADRATE91	0.481 (0.005)	0.300 (0.090)	0.081 (0.656)	-0.104 (0.566)	-0.255 (0.152)	-0.727 (0.126)	33
ADRATE92	0.459 (0.007)	0.246 (0.168)	0.031 (0.863)	-0.099 (0.583)	-0.272 (0.126)	-0.253 (0.156)	33
STANDINV	0.048 (0.386)	0.068 (0.340)	0.271 (0.048)	0.264 (0.052)	0.147 (0.186)	0.262 (0.054)	41
ALLINV	0.026 (0.437)	0.080 (0.314)	0.283 (0.040)	0.234 (0.075)	0.173 (0.146)	0.208 (0.102)	41

Notes:
2-tailed test significance levels shown in brackets.

8.6 THE IMPACT OF PUBLIC HOSPITALS ON COMPETITION

The competition indicators used in the analysis above do not discriminate between the competitive pressures exerted by public or private hospitals; both types of hospital were included in the indicators. However it is possible that being located close to public hospitals has a different effect to being located close to private facilities. More specifically it may be the case that whereas

competition with other private hospitals may tend to increase prices through quality competition, competition with public hospitals may tend to decrease prices through price competition.

In order to (briefly) investigate these possibilities the sample was divided into two groups; those which had a public hospital within a two kilometre radius, and those hospitals whose sole competitors were other private hospitals. Correlation ratios between the COMP2 measure and indicators of (i) price and (ii) quality were computed for the two groups separately and the significance of any difference between the correlation ratios was tested using the z test of difference for unrelated Pearson's correlation.

The value of the correlation coefficients did not support the initial hypothesis that public hospitals may stimulate price competition whereas private hospitals stimulate quality competition. Correlation ratios between measures of price and competition were slightly higher amongst the group of hospitals in close proximity to a public hospitals ($r = 0.538$) than amongst the group which was not ($r = 0.291$) however this difference was not significant at the 5% level ($z = 1.50$). Correlations between COMP2 and quality indicators did not yield a clear pattern, but it was certainly not the case that there was greater quality competition between those hospitals with only private hospitals in their market area.

8.8 SUMMARY

In this chapter the database on private hospitals in Bangkok was supplemented with financial data and indicators of competition so that the form of hospital competition in Bangkok could be explored. Concentration measures suggest that the hospital market in Bangkok has fairly low levels of concentration. Even using market areas with very short radii many hospitals appear to face high levels of competition. Nonetheless, the overwhelming majority of hospitals in Bangkok are making positive, and reasonably substantial profits. Profitability compares favourably with that in the US hospital market.

Table 8.10 summarizes the relationships found between measures of competition based on a two kilometre market area and the four variables of interest indicated in Table 8.1.

The competition indicators based on a two kilometre market radius revealed more significant

results than those based on a five kilometre market radius. The COMP measures which simply counted the number of competing hospitals within a given radius yielded more significant results than the BEDCOMP measures which measured the share of beds that the focal hospital had in the market area. The Hirschman-Herfindahl indices (based on bed numbers rather than cases) also yielded significant results. This pattern suggests that the important factor affecting the form and intensity of competition in Bangkok is not the degree of inequality in hospital sizes but rather the sheer number of competing hospitals.

Table 8.10
Relationship found in Bangkok between key variables and competition indicators

	COMP2	Sig at 5% level	BED-COMP2	Sig at 5% level	HHI2	Sig at 5% level
Fees/price	+	yes	-	no	-	no
Profitability[4]	+	yes	-	no	-	yes
Quality						
Financial indicators	+	yes	-	no	-	yes
Structural indicators	~	no	~	no	~	no
Service intensity per visit						
Investigations	~	no	~	no	~	no
Throughput data	+	yes	~	no	-	mainly no

Key: + indicates a positive correlation between the two variables
- indicates a negative correlation between the two variables
~ indicates that no clear correlation pattern emerged
yes indicates significance at the 5% level
no indicates that the correlation was not significant at the 5% level

Although several of the correlation coefficients were significant at the 5% level, few of them were very strong. The strongest evidence relates to profitability and admission rates. Hospitals in market areas where there was low concentration (ie. where there would be thought to be high

[4] Excluding Decha Hospital.

competition) tended to have higher profitability and also possibly higher prices. The evidence on quality and service intensity was somewhat mixed but pointed in the direction of higher competition also being associated with higher quality and higher service intensity. Thus the analyses refute traditional models of price competition, but do not definitely conclude which forms of competition prevail in the market.

The correlation analyses and scatter plots were supplemented by an examination of factors explaining the difference between actual price and estimated quality adjusted price. The regressions reported in Table 8.5 show that even once quality considerations are taken into account, prices are higher in hospitals facing more competition. This provides further evidence contradicting the existence of price competition and suggests that quality competition is not dominant but probably co-exists with supplier induced demand and/or increasing monopoly due to informational asymmetries and high search costs.

The chapter also provides interesting evidence relating to the impact of hospital ownership upon competition. Hospitals quoted on the stock exchange were found to charge higher prices even once differences in quality of care were taken into account, and consequently made higher profits. Non-profit hospitals did not appear to charge significantly more or less than other private hospitals once quality differences were accounted for. However this latter result may be due partly to the fact that the price data came principally from middle class insured patients and non-profit hospitals may be employing differential charging strategies so that they can cross-subsidize from wealthier to poorer patients.

The impact which public hospitals have on the form and intensity of competition was briefly explored; the presence of public hospitals did not seem to make a major difference to the form of competition. Specifically there was no evidence to suggest that public hospitals, which tend to charge less than private hospitals, stimulated price competition in the market.

CHAPTER 9
DISCUSSION OF THE FINDINGS

9.0 INTRODUCTION

In this chapter the results presented in the three previous chapters are drawn together and interpreted. In particular the original study hypotheses and objectives are considered. The chapter is structured around the research objectives addressing first the issue of asymmetric information and product differentiation, second the issue of consumer behaviour and search activity and third the nature of hospital competition. The final section of the chapter reviews the research methods used and their strengths and weaknesses.

9.1 ASYMMETRIC INFORMATION AND PRODUCT DIFFERENTIATION

9.1.1 Product differentiation

The study hypothesized that in developing country hospital markets there was a substantial degree of product differentiation which would both segment the market and contribute to problems of asymmetric information between consumer and provider, in turn giving rise to monopolistic competition.

There were substantial differences in characteristics between the hospitals investigated. The analysis of hospital characteristics in Chapter 6 suggested that both horizontal and vertical differentiation were present in the market. At the 'top end' of the market, hospitals were primarily distinguished from one another by having more or less of the whole range of characteristics, but at the lower end of the market there was considerable horizontal product differentiation.

The nature of the analysis undertaken in the study, focusing on characteristics such as hotel aspects of care, nursing, hospital facilities, doctors' skills, precluded the consideration of certain alternative types of product differentiation which may play a key role in the hospital market. The consumer survey found that hospital advertising often focused upon one particular service such as geriatric care or maternity care. If hospitals aimed to segment the market in order to protect market power, then differentiating themselves on the basis of specialties offered is probably a more effective strategy than differentiating on the basis of characteristics. Consumers are rather more likely to be able to associate a particular hospital with a particular type of service, rather than with a particular pattern of characteristics. Responses to the consumer survey indicated that

the same consumer was likely to use different hospitals according to the complaint with which he or she was presenting. In some respects this reflects the vertical product differentiation in the market; consumers turned to increasingly sophisticated, well equipped and well staffed hospitals as their condition became more severe, but this pattern also suggests differentiation by specialty.

The establishment and advertisement of specialist facilities within general hospitals in Thailand appears to be a relatively recent phenomenon. It may be that as the hospital bed to population ratio in Bangkok has now reached quite a high level, hospital competition strategies are increasingly turning towards horizontal differentiation and further market segmentation.

The characteristics approach to product differentiation is conceptually useful in the health care sector but may be of limited value in the analysis of competitive strategies. Product differentiation in health care is equally likely to be rooted in the multi-product nature of the hospital firm and differences in the combination of services produced, as in different bundles of characteristics.

9.1.2 Characteristics valued by consumers

There was a considerable degree of concurrence between the consumer survey and the hedonic price analysis on which aspects of care were highly valued by consumers. Both pointed to the importance of physician inputs and skills. The consumer survey also highlighted the central role of geographical accessibility in utilization patterns in Bangkok. Equipment was found to be important, by both the consumer survey and the hedonic price analysis, but in the consumer survey at least, it was found to be a secondary level factor. The characteristics to which consumers gave high priority were similar regardless of whether they chose to use a public or private hospital, the only difference being the level of priority which they accorded to seeking care at a reasonable price.

The analysis suggested that consumers were concerned with the characteristics of services which are likely to influence the clinical quality of care provided, rather than the more self-evident hotel aspects of care which have little impact on clinical quality. This is contrary to what has sometimes been asserted about the nature of competition between hospitals.

The hedonic price analysis focused attention on the issue of 'prestige' or 'reputation'. Although the

variable initially used to represent reputation (AGE) was not found to be significant, the PRESTIGE variable reflecting proximity to university teaching hospitals was highly significant. The analysis however left unclear quite how this prestige effect occurred. It could be that certain areas of Bangkok are known for health care (the 'Harley Street' effect). Certainly there is a tendency in Bangkok for similar service providers or retailers to group together in one place. In addition, some private hospitals may reap benefits from the fact that they are known to be associated with a particular public teaching hospital and probably draw many of their part time medical staff from this hospital. Often these associations are well known amongst the local population.

The hedonic price analysis and the consumer survey both suggested that consumers paid little attention to the quality and availability of nursing staff. At the same time the multivariate analysis undertaken in Chapter 6 indicated that this was an area where some hospitals may compromise quality in order to save costs. Discussions with hospital directors further revealed that attracting and retaining good nursing staff has become increasingly difficult during the past three to four years as expansion of the private sector has bid up nursing salaries. The lack of consumer vigilance in this area combined with hospital incentives to compromise nursing standards, suggests that government regulation and enforcement of minimum nursing standards may be an important measure to ensure clinical quality in the private sector.

The consumer survey showed that the reasons for selecting a hospital and choice of hospital varied with the condition a patient was presenting with. This was supported by the hedonic price analysis which found different characteristics to be highly valued for different conditions. This pattern suggests a considerable degree of consumer sophistication.

9.2 CONSUMER BEHAVIOUR AND SEARCH ACTIVITY

Consumers appeared to be relatively well informed about the hospital care market. There are limited international data with which to compare the information collected here, however the consumer survey suggested that at least at the top end of the market many consumers were aware of differences in prices, equipment, skills and comfort between hospitals. Moreover consumers appeared willing to add to their stock of knowledge through search behaviour when necessary. The most common example of this found in the consumer survey was seeking advice from friends

and relatives, but consumers also recalled advertisements and consulted physicians for advice. Consumers were generally willing to seek independent advice from another health care provider. The practice of seeking a second opinion appeared to be far more prevalent in Bangkok than it is in the West and may reflect both traditional patterns of multiple resort and the more consumerist behaviour of patients seeking care in a private for-profit dominated health care sector.

In other respects however consumerist behaviour was less evident. Price appeared to play only a minor role in determining choice of provider. Respondents were, on the whole, reluctant to switch from a 'regular' provider despite increases in price or personnel changes. Few respondents were willing to complain even if they were seriously dissatisfied with the care received. Nearly half of those who had been seriously dissatisfied at a particular facility in the past, had since returned to that facility. There appeared to be an especially strong reluctance to confront personally a health care provider, thus the main consumerist activity took place before seeking care (for example searching for information) or after (for example obtaining a second opinion), rather than during a consultation. This tendency is partially culturally driven; in Thai culture direct conflict is rare and there is considerable fear of 'tat naa' or 'cutting face', that is offending someone or damaging their reputation. People are probably particularly reluctant to 'tat naa' with doctors who are held in high respect.

The differences in consumerist behaviour between respondents covered by different types of insurance were not as clear cut as initially anticipated. However this is not necessarily because insurance status does not influence consumer behaviour. Indeed the way in which public sector employees switched to public sector hospitals as the expected price of care rose suggests that insurance status does affect health care seeking behaviour. What was not anticipated was the complexity of insurance coverage amongst middle class groups, particularly those working in the private sector. Many private sector employees had private insurance or employer paid health insurance on top of their social security coverage, which considerably complicated the analysis. In particular, employer based schemes were of far greater significance than had been anticipated at the outset of the study. There are clearly issues here which require further research to help policy development in Thailand. Although a recent study has examined employer medical schemes for bank workers in Bangkok (Panichpathompong 1994) little is known still about the total population coverage and benefits offered by employer schemes. In addition a clearer

understanding of how individuals with multiple insurance coverage use this coverage would be helpful for policy formulation on health insurance.

Very different degrees of consumerist behaviour were observed in public and private sectors. This was especially clear with respect to allegiance to a particular hospital, but it was also apparent in consumers' complaints. Consumers in the private sector appeared far more likely to switch from their regular hospital if certain aspects of the service changed, or to complain if they were dissatisfied with the care received. This implies that in more commercially oriented health care systems patients are inclined to be more active consumers.

The observed patterns of consumerist behaviour have implications for the form of competition in the hospital market. The low price sensitivity amongst consumers suggests that there is little pressure for price competition. Knowledgeability about and willingness to seek information on alternative providers may help stimulate quality competition. It was hypothesized in Chapter 4 that the weak institutional controls upon health care providers in many developing countries may mean that consumers are the key factor constraining inappropriate provider behaviour. Consumers' willingness to carry out search activity and to seek second opinions suggests that they may be partially effective in this role. However a reluctance to question health care providers during a consultation, means that consumers are in a particularly weak position where they perceive that they require immediate attention. This would suggest that the market for elective services where consumers have time to shop around or seek second opinions, is likely to work considerably better than that for emergency services.

9.3 COMPETITION

Analysis of competition in the market place found that hospitals facing higher levels of competition were more profitable and possibly charged higher prices. However it was difficult to disentangle fully the reasons underlying this.

To some degree the phenomenon may be explained by quality competition, certainly higher levels of expenditure and assets per bed were found in the more competitive parts of the market. It was initially supposed that quality competition was unlikely to be very prevalent in Bangkok because of the absence of certain institutional conditions such as non-profit ownership and high health

insurance coverage. The fact that quality competition does appear to be prevalent in the market, may be partially attributable to higher levels of health insurance than was initially anticipated. In addition, it also points to the importance of quality signalling in the market. In Bangkok, there are few alternative sources of information on quality of care to the hospitals themselves. Thus signalling quality, through for example procurement of high technology equipment, may be a good investment for hospitals.

However even when quality differences between hospitals were explicitly taken into account, it was still found that hospitals in more competitive markets charged higher 'quality adjusted' prices and made higher profits than those in less competitive markets. The two possible explanations for this are supplier induced demand and the presence of rising search costs leading to increasing monopoly power for providers. The data suggested that supplier induced demand may be occurring in the Bangkok hospital market; those hospitals facing high levels of competition also had significantly higher admission rates than other hospitals. However it is difficult to assert with certainty that supplier induced demand was present because of a variety of other causal relationships which may explain the observed association. For example there was a strong positive association between the competition measures used and location in the centre of the city. Results of the consumer survey showed that those hospitals in the city centre tend to be accessed for more complex cases whereas hospitals on the outskirts of the city provided care for more simple cases. Higher admission rates and lengths of stay at centrally located hospitals may therefore be attributable to a more complex case load rather than supplier induced demand.

The interpretation of the correlation between intensity of competition, and admission rates is important. If this relationship is due to primarily to the provision of unnecessary services in order to increase revenues then it is clearly a matter for concern. However it appears likely that the explanation is more complicated; location in the city centre implies not only a greater level of competition but may also confer some kind of 'reputation' for more sophisticated or higher quality service. Such hospitals will therefore attract more complex cases, and it is still a relatively open question as to whether they over-provide services.

Ownership affected hospital conduct in the face of competition. A clear difference emerged between the conduct of stock exchange owned hospitals and other hospitals. Hospitals quoted on

the stock exchange offered care of a higher quality and higher price than other hospitals, and at the same time made higher profits. This suggests that the superior access to finance which stock exchange ownership offers, gives hospitals a competitive advantage. There are a number of mechanisms through which this effect may occur. Competitive advantage could be gained through industry leadership in investment in high technology equipment. There are substantial advantages to being the first entrant into high technology equipment services, but also substantial risks. In the US it was estimated that high-technology equipment may take five years to make a profit (Cleverly 1992), therefore it requires commitment and financial strength to be a forerunner in these sorts of investments. It is clear from the data available on high technology equipment in Bangkok that stock exchange owned facilities have always been amongst the first to invest. Such investments may form part of a 'virtuous circle'. Cleverly (op cit) suggests that in the US, hospitals which had better reputations or gave the impression of higher quality could 'premium price' ie. charge prices higher than their quality advantage warranted. This is the same phenomenon as observed in Bangkok. Successful early investment in high technology equipment or new clinical techniques may bear benefits for the whole business. Cleverly further suggests that once hospitals have achieved this type of reputation, premium pricing may itself be taken as a signal of higher quality.

Little difference was found between the group of non-profit hospitals and private for-profit hospitals. In particular no difference in pricing policy between non-profit and for-profit hospitals was discernible once quality differences were taken into account. This may partially be an artifact of the price data used. Price information was collected principally from insured patients under the Civil Servant's Medical Benefit Scheme; it is possible that non-profit hospitals price differentiate, charging insured patients more than they charge others. It is certainly the case that non-profit hospitals (unlike for-profit ones) have a formal exemption policy for the indigent. However discussion with non-profit hospital directors suggest that only a small minority of patients are exempted. This leads to the conclusion that non-profit hospitals in Bangkok generally do not operate on a substantially different financial basis to for-profit ones. This mirrors evidence from the US which shows that non-profit hospitals have traditionally been operated along business lines and often make substantial surplus (Stevens 1989) On a provisory note, the cluster analysis in Chapter 6 suggested that there may be two types of non-profit hospitals; the old type such as Kwong Sui and Chongchin which had poor staff to bed ratios and very long lengths of stay, and

the 'newer' type such as Mission and St Louis. The older type of hospitals were not included in the price analysis as there were insufficient price observations for them, but it is possible that they have stronger charitable element in their operations.

Even once factors such as quality of care, competition and ownership are taken into account there appears to be considerable unexplained variation in the price of hospital care in Bangkok. This is probably partly due to 'noise' in the data, but it may also reflect the fact that the market is simply not working well. The models of monopolistic competition described in Chapter 2 suggested that when both product diversity and asymmetric information are present in the market, sellers may have market power, despite the presence of competitors. This is broadly the hypothesis of the increasing monopoly model. As both asymmetric information and product diversity are present in the Bangkok hospital market it is not surprising to find unexplained variations in price.

In the analysis in Chapter 8 it was found that the COMP and HHI indicators of competition produced more significant results than the BEDCOMP indicator, and that the COMP variable was generally stronger than the HHI variable. This pattern is of interest. The HHI indicator captures both the number of firms in the market and the degree of inequality in size of firms in the market. In traditional oligopoly theory these two factors together are likely to affect market power (Waterson 1983). However it would appear that in the hospital market in Bangkok the degree of inequality in size is not nearly as important as the number of firms in the market; this implies that market power is not derived in the manner that traditional theory predicts ie. through monopoly power, but through informational asymmetries relating to the number of hospitals in the market.

Pricing for normal deliveries was found to be far more predictable than that for acute appendicitis. This may be due to the fact that a normal delivery is an elective procedure and the prospective patient has sufficient time to compare potential care providers and make a rational choice between providers. Moreover there may be a strong 'reputation' effect; women giving birth probably have friends and relatives who have had a similar experience and from whom they can seek advice. Thus for normal deliveries problems of asymmetric information in the choice of a hospital may not be particularly acute. In contrast, patients are likely to have little time to plan an admission for an acute appendicitis operation and it is likely that advice from informed friends and relatives

will be rather harder to secure than in the case of a normal delivery. The greater significance of asymmetric information problems for acute appendicitis operations is likely to make the market function more imperfectly; leading to a larger degree of unexplained price variation in acute appendectomies.

9.4 METHODS: STRENGTHS AND WEAKNESSES

A variety of different methods for data collection and analysis were used in the study and it is not possible to consider all of them here. This section focuses upon the more innovative aspects of the study, and also identifies the main shortcomings in the analysis. The exploratory nature of this study needs to be emphasized. Virtually no previous studies of the nature of hospital or even health care competition in developing countries have been undertaken. There were no obvious methodological approaches to adopt and very little evidence about the types of competition in developing country health care markets, hence making it difficult to develop tight hypotheses about their operations. Furthermore the methods used in this study were constrained by the data available and the problems in accessing the records held by private providers themselves.

9.4.1 Data collection and processing

With respect to the survey methods used, the consumer survey which was implemented through employers worked well. Both public and private sector employers were extremely cooperative. Undoubtedly this was partly because the survey was implemented through the Ministry of Public Health; most independent researchers would not have received the same level of cooperation. Where stratification of a sample by employer or insurance group is desired then working through employers appears a very satisfactory way of proceeding. On the other hand the survey of private hospitals was less successful, the response rate was poor and the throughput data in particular were patchy. The low response was attributable to the break down of the registration process as a sanctioning mechanism. It would appear that either some form of sanctions or very strong incentives are required in Bangkok to induce private providers to give basic data to the Ministry of Public Health. However without the political will to implement either of these approaches the problems associated with planning and policy formulation based upon very poor data from the private sector are likely to persist. In addition there may be problems with the quality of some hospitals' aggregate patient data due to weak information systems. Although some private hospitals in Bangkok have state of the art information systems others have very primitive ones (Prokosch

and Bunge 1995).

The collection of price data on private providers from the various government sponsored health insurance schemes was largely successful. The only drawback to this approach was that it was quite a time consuming one; a team of eight students was employed for several weeks to find and painstakingly go through large and often rather disorganized files at different government ministries and departments. Even then the number of cases on which price data were collected was rather small for the purposes it was used here. Future analysis of insurance records would benefit immensely from the computerization of existing administrative procedures. This would make it possible to carry out simple analysis, examining for example charges for different diagnoses at different hospitals or average lengths of stay by hospital, on a routine basis.

In the Bangkok context the data required to compute concentration ratios or the Hirschman-Herfindahl index based on patient flows were not available. This is likely to be the case in most developing countries. The measures of market concentration used in this study were rather simpler, based upon (i) the number of competing hospitals within a given market radius (ii) the share a particular hospital had of all beds in the market area and (iii) the Hirschman-Herfindahl index based on bed number. The relative advantages and disadvantages of the different types of measures probably depends partly on the forms of competition prevalent in the market. However the measures are also extremely sensitive to how market area is defined. This study opted for an extremely simple definition of market area. Other studies have used more complex definitions based upon actual patient flows (eg. Robinson et al 1991) or alternative simple measures based upon administrative boundaries (eg. Noether 1988). Given the dramatic effect of definition of market area on competition indicators the relative advantages and disadvantages of different ways of defining markets requires more investigation.

This study used data from a variety of different secondary data sources as well as implementing two separate primary data surveys. There is clearly a question concerning the reliability and consistency of data taken from a variety of different sources. Frequently in the analysis the sample size changed as data on some variables were available for some hospitals and not for others. On the whole the data concerning private hospitals which was taken from secondary sources (such as the price data and the profitability data) appear more reliable than the information given by

hospitals under the private hospital survey. Hospitals are obviously compelled by law and/or by their own financial interests to provide reasonably accurate data to the Ministry of Commerce and insurance funds. It is only through efforts, such as the one made during this study, to link the various sources of information that greater insight can be gained into what are valid and reliable data and what are not.

9.4.2 Data analysis

Multivariate analysis was used in Chapter 6 in order to examine the nature of product differentiation and to identify different clusters of hospitals. Whilst this analysis provided some insights into the nature of product differentiation and hence competition it is clear that the results were not clear cut and require careful interpretation. This is a well known problem of multivariate analysis, but does not prevent it from being useful for exploratory purposes. A further shortcoming of this analysis which was discussed earlier, was its failure investigate hospital product differentiation rooted in different product-mix or specialties.

A key problem with the analysis of the form of competition related to the fact that the concentration measures used were unable to distinguish between locational factors, which would appear very important in the Bangkok context, and market concentration. The confounding factor of location made it very difficult to determine the form/s of competition prevailing. However the problem lies not so much with the simplicity of the competition measures but with the way in which they were used. Even if more sophisticated measures competition measures were used, the same problems would have been encountered.

There are at least two approaches to resolving this problem. Firstly this study focused on the cross-sectional analysis of competition, comparing hospitals in the market who at the same point in time faced higher or lower degrees of competition. A longitudinal study may be able to determine better how a hospital, located either in the centre or on the periphery, responds to increasing levels of competition over time. However a longitudinal approach might also suffer from problems of confounding variables, for example changes in government policy, such as cessation of BOI support to capital investment, may make results difficult to interpret.

Secondly part of the problem relates to a limited understanding of how competition might affect

the key variables (price, profitability, quality and service intensity) and in particular what functional form the relationship between these variables might take. This study used simple correlation analysis and scatter plots to examine the relationship between the variables but if there was a stronger notion of the underlying functional forms then more complex analyses might have been undertaken. For example it is possible that supplier induced demand or quality competition only become significant once a certain level of hospital market saturation is reached. This would suggest a non-linear relationship between the variables. Stronger behavioural foundations for the competition models are required in order to improve the means used to test them.

9.5 SUMMARY OF DISCUSSION

The combination of approaches used in this study sheds light on the nature of hospital markets in Bangkok and in particular the three central hypotheses concerning the extent and nature of product differentiation, consumer search behaviour and the form of hospital competition.

A simple overview of hospital characteristics revealed a substantial degree of differentiation between hospitals, including both horizontal and vertical product differentiation. Considerable concurrence was found between the consumer survey and the hedonic price analysis as to which hospital characteristics people thought to be important. On the whole people focus on those types of characteristics (ie. those related to the clinical quality of care) which health professionals would consider to be important.

In certain respects a high degree of consumerist activity was observed. This supports one of the initial hypotheses postulating that because of the institutional features of hospitals markets in developing countries, particularly the lack of a strong regulatory authority and the prevalence of the profit-motive amongst providers, patients would undertake a high level of search activities and consumerist behaviour. However in other respects, particularly in terms of price sensitivity, consumerism appears limited. It is not surprising therefore that no evidence of price competition between hospitals was found. There is evidence of quality competition, and it is also likely that models of supplier induced demand and increasing monopoly help explain hospital competitive behaviour in Bangkok.

Differences in behaviour between the stock exchange hospitals and the other hospitals in the

sample was evident. Stock exchange hospitals tend to have higher prices and profitability than other hospitals even once their quality advantage is taken into account. The hedonic price analysis raised a question about reputation or prestige and it would appear that certain hospitals including many of the facilities quoted on the stock exchange benefited from a good reputation. Despite extensive discussion of reputation in the theoretical literature and its apparent importance in this study there is very little work examining how reputation is formed.

The study collected a substantial amount of data about private hospitals in Bangkok from secondary sources. For data collection from private hospitals these appeared to be more reliable than primary sources, however such data collection is problematic as the different sources of information need to be reconciled. The competition measures constructed for the study appear useful even though they are rather simpler than the measures often used. In future studies of this nature, a more careful consideration of hospital specialties (ie. product differentiation through variation in product mix), the formation and nature of hospitals' reputations, and the dynamics of competition would be useful.

CHAPTER 10
CONCLUSIONS AND RECOMMENDATIONS

10.0 INTRODUCTION

This final chapter returns to the three hypotheses presented in Chapter 5 and questions whether they have been proven or not and, where appropriate, what extra information would be required in order to test them properly. Section 10.2 builds upon the discussion in the previous chapter of methodological strengths and weaknesses by more critically addressing problems with the data and non-availability of data. Alternative strategies for future research in this area are discussed in section 10.3 Section 10.4 considers the implications of the analysis for health policy in Bangkok and in 10.5 the political economy of reform in Thailand and potential obstacles to the recommendations are set out.

10.1 HYPOTHESES TESTED

10.1.1 Hypothesis 1

A high level of product differentiation in the hospital market in Bangkok contributes to problems associated with asymmetric information and also market segmentation.

The analysis suggested that there were substantial differences in the characteristics of hospitals in Bangkok. However it was not possible to trace directly the impact of this product differentiation upon the nature of competition. Our conclusions therefore are based primarily upon inference.

With respect to product differentiation we were interested in establishing whether, as often predicted, private hospitals had higher quality hotel aspects (such as promptness of service, luxury of surroundings etc.), whilst public hospitals offered higher quality clinical care. If this were the case then it would imply market segmentation with private hospitals being used for less severe conditions and public hospitals for more severe ones.

The multivariate analysis suggested that there were significant differences *within* the private sector; whilst some hospitals had very high quality characteristics in all dimensions others were poor in many dimensions. A small group of private hospitals were identified which seemed to perform well in terms of hotel aspects of care but poorly in terms of staffing. However this was

not a general pattern across the group, suggesting that the form of market segmentation frequently supposed was not present in the market.

This was supported by the findings from the consumer survey. For those respondents whose insurance coverage did not give them explicit incentives to move away from the private sector as care became more expensive, there was no observed tendency to seek public sector care for more severe conditions. This obvious form of market segmentation between public and private sectors was therefore not present.

Market segmentation in Bangkok takes more sophisticated forms. The consumer survey suggested that some hospitals were used predominantly for simple conditions and were hardly selected at all for more complex or severe conditions. At other hospitals utilization tended to increase with severity of the complaint. This pattern was observed within both the public hospital sector and the private hospital sector. The picture which emerges is not one of clearly segmented markets along lines of ownership, but rather of a gradation of characteristics between hospitals which is relatively independent of ownership.

With regard to the impact of product differentiation on asymmetric information and hence monopolistic competition the study is inconclusive. Product differentiation exists, but consumers were remarkably well (although not perfectly) informed about the differences between hospitals. Methodological difficulties encountered in establishing a link between asymmetric information and alternative models of competition are discussed in section 10.3.

10.1.2 Hypothesis 2

Market failure in health care is rooted in problems of asymmetric information. Consumers in Bangkok will undertake a high level of search activities and consumerist behaviour. Such behaviour will limit the scope for perverse forms of competition such as supplier induced demand.

The literature review and chapter 8 demonstrated there were a number of different dimensions to consumerism and aspects of asymmetric information. As discussed in the previous chapter consumers in Bangkok were very 'consumerist' in some senses and less so in others.

Although consumers were well informed about the facilities at different hospitals, willing to search out more information and seek second opinions, there were a number of dimensions in

which they did not act in a consumerist manner and this would allow scope for 'market failure'. Most notably:-

- consumers were not strong during consultations: they were unwilling to complain if they thought they received inadequate care. Potentially this allows providers to offer unnecessary services during a consultation or to skimp on care provided;
- consumers seek out information about hospitals but do so for only certain dimensions of care such as physicians and equipment. Potentially this would allow providers to cut corners on certain aspects of care such as nursing care;
- consumers were not found to be price sensitive, this may partly be a product of high insurance coverage amongst respondents but even where consumers had only very partial coverage they were still unwilling to ask providers about price. Potentially this would allow providers to charge higher mark-ups on their products.

10.1.3 Hypothesis 3

Price competition is not the dominant form of competition in the market. Price competition may exist in the market but so too will quality competition and/or supplier induced demand.

Results presented in chapter 8 and the discussion in chapter 9 suggested that price competition was unlikely to be present in the market place. Here we address whether the data found really prove this result.

In chapter 4 it was stated that price is based upon the average cost of a service plus a mark-up, and that the most direct test of price competition would be whether higher levels of competition eroded the mark-up. Thus it is possible that the higher prices observed in more competitive markets were due not to higher mark-ups but to higher costs, possibly associated with higher quality. There is indeed some evidence to support this perspective: both assets per bed and expenditure per bed seemed higher in more competitive markets.

Profitability was also found to be higher in more competitive markets, and it was suggested that this may be further evidence to refute the existence of price competition. However as equation (4) in Chapter 4 suggests, profits will also be affected by output. So a story consistent with the data, could be that higher competition leads to investment in quality, raising both costs (and hence prices) and throughput (and hence profits).

The price-index used in the analysis abstracts from issues of case-mix by focusing on prices for

a basket of defined diagnoses. However case-mix may affect the findings on profitability. Investment in quality may enable a facility to provide more complex services than previously offered. If mark-up on more complex services is generally higher than on less complex ones, then a change in case-mix towards a more complex case-load, may result in higher profitability, whilst being consistent with generally lower mark-ups overall, and no change in total throughput. Again this scenario is consistent with the data: hospitals in the centre of the city faced higher competition and according to the consumer survey also tended to be used more for more complex conditions.

The investigation of the impact on the difference between actual price and quality adjusted price (price predicted by hospital attributes) was undertaken in order to try to assess whether higher prices in some hospitals in more competitive markets was due simply to higher quality. It was found that in more competitive markets, prices actually charged were higher than the prices which would be predicted given the quality configuration at the hospital. This led us to infer that even after quality factors are taken into account, prices are higher in hospitals that face greater competition. However as pointed out previously, prices are affected not only by mark-up but also by costs. The quality adjusted prices were based on an estimate of what people would be willing to pay for incremental quality: they do not necessarily reflect the cost of providing extra quality. Hence the results do not rule out the possibility that higher costs associated with higher competition force hospitals to lower mark-up, implying that quality and price competition co-exist.

In conclusion, the results do rule out the possibility that price competition is the **only** form of competition in the market-place. However the results could be consistent with price competition and quality competition existing side-by-side, or alternatively there could be no price competition and purely quality competition in the market.

For the other forms of competition (supplier induced demand and increasing monopoly), the evidence, as discussed in Chapter 9, is unclear. The results on prices and profitability are consistent with supplier induced demand, although few advocates of the supplier induced demand model would argue that providers can actually increase profits in response to greater competition. The direct evidence on supplier induced demand is weak: neither measure of intensity of investigation increased in response to competition, and the finding of higher assets and expenditure per bed in more competitive markets is probably more likely to indicate quality competition than induced demand.

10.2 BIAS AND DATA AVAILABILITY

Some methodological and data issues relating to the survey design, implementation and analysis of the various components of this study were discussed in section 9.4. This section extends that discussion.

Data availability

The most critical variable on which data were not available in Bangkok were hospital costs. Ideally, in order to test the existence of price competition we required data on hospital mark-ups over average variable cost by condition. Data on mark-up have not been commonly available in UK and US studies. Propper et al (1997) compute mark-up over average cost, based on data on the average cost by specialty by hospital and adjusting for case-mix. Gruber (1994) relied on net income as a proxy for mark-up. However, as discussed earlier, there are substantial problems with this proxy as it is also dependent upon costs and output.

The problem of lack of data on mark-up, and costs more generally in Bangkok is exacerbated by lack of data on patient throughput and case-mix. Without cost data, data on these variables is critical to a clearer understanding of how hospitals respond to competition. For example, data on hospital annual expenditure were available in Bangkok but without data on number of patients we were unable to establish whether changes in profitability could be attributed to changes in efficiency, or changes in patient flow. Even if data on patient throughput were available, lack of information on case-mix at particular facilities would be a critical barrier to reaching final conclusions about the impact of competition on hospital behaviour.

Use of stated preferences in Consumer survey

The consumer survey presented respondents with a mixture of both hypothetical questions and questions about their actual choices. The use of hypothetical questions was necessary to get sufficient variation in the sample whilst operating within a limited budget. There are a however a number of well recognized problems with the use of data on stated (as opposed to revealed) preferences. People may not actually do what they say they will do in response to hypothetical questions (and there is no way of knowing whether they would) and there is also an observed tendency to over-state responses under experimental conditions (Adamowicz et al 1994, Kroes and Sheldon 1988). To what extent do these problems affect the reliability of the results?

There is no way of knowing whether respondents would actually do as they said but a number

of factors suggest that the findings coming out of the survey are fairly reliable. First the survey used a mix of hypothetical and actual experience questions: for the section on extent of consumerist behaviour it is possible to compare responses to these two types of questions to check validity. For both types of questions, respondents consistently demonstrate quite a high degree of consumerism although this may be somewhat over-stated in the hypothetical questions. For example nearly 40% of the sample said that they had on a previous occasion sought a second opinion. In response to the hypothetical question on this issue, approximately 77% of respondents answered that they would advise someone being diagnosed with cancer to seek a second opinion and 50% advised a second opinion for a Caesarian Section.

Second the questions asked in the survey were relatively straightforward, not requiring respondents to compare highly complex scenarios, and they referred to situations which respondents would have been familiar with. 8.4% of the sample had been admitted to hospital during the previous year and each respondent had on average 3-4 outpatient visits during the previous year, hence the decision making process which they were asked to reveal in response to the hypothetical questions was a familiar one. The relevance and familiarity of the context to respondents is likely to contribute to the reliability of responses (Vatn and Bromley 1994)

Consumer survey bias

A second major consideration in interpreting the results of the consumer survey is the bias of the sample to upper middle-class residents of Bangkok, and a bias towards those with insurance coverage. As discussed previously it appears that the principal users of private hospitals in Bangkok, particularly for inpatient care are the upper middle class. The sample selected for the consumer survey was therefore purposively biased towards this group. The level of knowledge among this group is probably more relevant to the question of the nature of competition between private hospitals, than the level of knowledge among the Bangkok population as a whole.

The high level of insurance coverage amongst the respondents is more perplexing. At the outset of the research it was thought that a significant proportion of the middle class in Bangkok would be uninsured, covered by neither the Social Security Scheme (if they worked in small enterprises) nor the Civil Servants' Medical Benefit Scheme (if they worked in the private sector). As private health insurance coverage in Thailand is very limited they would not be covered by this either. However the high level of insurance found amongst respondents is a finding in itself. More consumers than anticipated do have an agent representing them in the health care market - though the effectiveness of this agent as a purchaser is doubtful.

Reliability of price data

This was discussed to some extent in section 9.4. Information on prices was gleaned from records held by insurance organizations (principally the Civil Servants' Medical Benefit Scheme). Besides the relatively small sample size for each diagnosis examined there may also be concerns that prices charged to insured persons are not representative of prices charged to the uninsured. As argued in Chapter 5 this should not be a substantial problem as in most cases the private hospital is unlikely to know whether the person seeking care is insured or not. The person claims reimbursement through his or her employer and thus the only reason to anticipate bias in terms of prices charged to the uninsured is if providers explicitly ask a patient about payment status. The small sample size for computing the price index would not be problematic if each of the diagnoses examined were clearly defined and exhibited only limited variation in complexity. This is the case for some diagnoses (ie acute appendicitis and normal delivery), but for other cases included in the basket, part of the variance in price may be attributable to variance in severity. It is difficult to predict, what if any bias this would impart to the data.

10.3 METHODOLOGICAL CONSTRAINTS AND IMPLICATIONS FOR FUTURE RESEARCH

Linking consumer information and market competition

At the outset of the study we wished to make a link between the form of asymmetric information in the market and the prevailing form of competition. Whilst the study included separate components looking at each of these facets it was difficult to make the link between the two ie. to explore exactly how asymmetric information affected market functioning. Instead, results from the consumer survey study were used more broadly to cross-check findings from the market analysis to see if the two were consistent.

One approach to making a clearer link between asymmetric information and market competition would be to explore more narrowly defined markets (such as markets for particular specialties) where asymmetric information problems are different, but market institutions broadly the same. For example the cost of information on maternity care is lower than for other elective, but less commonly occurring conditions. A comparison of hospital behaviour in the maternity market versus another elective care market might therefore be illuminating.

Role of physicians in affecting competition

Perhaps one of the most critical features of hospital markets which deserved closer attention in

this study is the way in which markets for physicians and the manner in which physicians are paid interact with hospital competition. There are two angles to this issue. First whilst hospital managers have control over broad hospital policy on resource use, physicians make day to day decisions about resources. The degree of physician independence in decision making will affect the competitive strategies available to the hospital. For example, for physicians to induce demand there must be an incentive for them to do so, which implies that their fee or salary is linked to revenue collected by the hospital.

Based on how physicians in Bangkok hospitals are usually paid, it was suggested that in general only limited incentives exist for physicians to induce demand. Most physicians receive a salary and/or a fixed percentage of the physician fee, thus there is unlikely to be any incentive for physicians to order unnecessary medical investigations (although there would be incentives for physicians to advise medical intervention, such as surgery). More recent discussions with hospital directors in Bangkok suggest that the mode of payment for physicians may be altering, for example some private hospitals with Social Security patients now offer physicians incentives to contain costs. Even at the time of the study however, a certain group of physicians, namely those who own and operate small private hospitals, faced considerable incentives to induce demand. An interesting study might therefore compare service intensity between physician owned and operated hospitals, and investor owned hospitals.

The results of this study indicate that whilst consumers seek out information about certain provider characteristics such as physicians and equipment, when choosing between hospitals, they neither value highly, nor attempt to measure, dimensions such as nursing profile. This would suggest that for private hospitals wishing to reduce costs whilst not losing custom it would be possible to skimp on nursing. Chapter 7 however indicated that although this is the case for a handful of hospitals it is not the rule. Why might this be so?

Hospitals depend critically upon physicians in order to attract patients. As the research demonstrates physician reputation is an important factor in choice of hospital. Physicians with good standing may be unwilling to work in hospitals with poor nursing profiles, for fear perhaps of bad nursing practice leading to mishaps which may be attributed by patients to them. In this case the market for physicians exerts a beneficial influence upon the hospital market which consumers are unable to do. Only physicians who have no (or poor) reputations, or who own the facility, might be willing to work in hospitals with low nursing ratios.

Further research on factors that physicians take into account when choosing where to do private practice, and how this differs by age, experience, and specialty would contribute to our understanding of hospital markets in Bangkok.

Price setting in hospitals

This study hypothesized that prices in hospitals would be set based on average cost with some mark-up, and that the mark-up would vary according to the level of competition in the market. However virtually nothing is know about how hospitals in Bangkok actually set prices. Hospital directors are clearly sensitive to competition to some extent as they talk about an 'acute appendicitis price index' suggesting that hospitals are well aware of what their competitors charge for this particular intervention. Micro-level studies exploring in detail the relationship between prices and costs in particular hospitals and how this varies by condition would be helpful to further attempts to explore hospital competition. Unfortunately gaining access to private hospitals in order to carry out such a study would be very difficult.

10.4 RELEVANCE OF RESULTS TO HEALTH POLICY IN BANGKOK

10.4.1 Expanding and strengthening purchasing agencies

In Thailand the Social Security Scheme (SSS) has been given high priority by the government. However perhaps inadequate attention has been paid to the informational aspects of the Scheme so that although a potentially effective agent for consumers exists, the possible powers of this agent have not been exercised to the full.

In 1994 the information system under the SSS was still not fully functional, although the Scheme itself had been running for three years. No attempts had been made to implement systems of peer review or ensure the quality of care in individual cases. Whilst guidelines exist about which facilities are able to be main contractors under the Scheme, the guidelines cover structural facilities only (eg. the number of beds must be at least 100), they do not cover aspects of staffing. Networks of health care facilities are becoming increasingly important under the SSS, particularly in Bangkok (Siriwanarangsun 1996). Only the main contractor must provide information to the SSS to show that it meets standards, associated facilities in a network are very weakly regulated.

In other countries in the South-east/East Asia region there seems to have been similar problems. Both Korea and the Philippines have well established social health insurance schemes with a

relatively wide population coverage, but offer inappropriate incentives to health care providers. For example in Korea most care is paid for on a regulated fee-for-service basis but fees for high-technology equipment are unregulated, this has led to an explosion in high-technology equipment (Yang 1993). In the Philippines reimbursement rates under the health insurance scheme (Medicare) favour small hospitals leading to rapid growth in this sector of the industry (Griffin et al 1994). Careful structuring of payment mechanisms under health insurance schemes is essential to generate appropriate incentives. Attention to the informational roles of purchasers has also been weak.

During the early 1990s health insurance in Thailand was viewed by policy makers almost solely as a mechanism for risk pooling, rather than as the development of a strong, informed, purchasing agent. Slowly this perception is changing, but the capacity building necessary to create a strong purchasing role is likely to be a slow process. Government institutions and officers in Thailand had no prior experience of collecting or processing the type of data required by the Social Security Scheme. Although public health care facilities provide summary information on the number of cases, diagnoses, surgical and non-surgical cases, and channel this to the MOPH, no data have previously been produced on a case-by-case basis, nor data on procedures performed, or costs per case. Concepts of peer review and managed care are only gradually reaching the Thai health care sector.

Social health insurance schemes may exert power as a payer and an agent for insured persons. The power of health insurance schemes can be exerted along two important dimensions: by changing incentives facing providers and by alleviating problems of asymmetric information.

Payment mechanisms define the incentives which providers face. The current use of fee-for-service payment under all schemes in Thailand except the SSS encourages providers to over-provide services, and there is no incentive for providers to offer cost-effective, efficient care. By shifting the form of payment away from fee-for-service, providers can be encouraged to reduce costs of care, and provide quality care more efficiently.

Recommendation 1: Under all state sponsored health insurance schemes in Thailand the insurance organization should move from simple fee-for-service reimbursement of providers to schemes which through their mode of payment create stronger incentives for efficient, and cost-effective care (such as case-based payment and capitation based payment).

Purchasers of health care possess a number of different tools which can be used to help prevent

the problems which arise due to asymmetric information, these include-

- limiting the providers eligible to provide care under the scheme and thus restricting patient choice. Such preferred provider-type initiatives can be used to channel patients to those providers who are most efficient. Having a limited list of providers and specific requirements for being eligible to join the list means that purchasing organizations can encourage appropriate management practices such as regular attendance at continuous education training for physicians, adoption of internal quality control procedures etc.
- providing information about the characteristics of alternative providers to help consumers make more informed choices about providers. This may be achieved through simply publishing indicators of quality (such as staffing inputs, waiting times, rates of hospital acquired infection etc) or alternatively through developing accreditation schemes.
- reviewing the quality of care provided by different hospitals. Health insurance organizations have privileged access to detailed information on the process of care which puts them at a unique advantage in terms of conducting peer review, or the routine analysis of investigation rates, surgery rates etc by hospital. Such review allows the purchaser to identify facilities or even specific physicians who are engaging in inappropriate practices.

Recommendation 2: The Thai government should actively encourage and support insurance organizations in Thailand to become more active purchasers of care, engaging in the type of practices outlined above.

Traditional forms of regulation which focus upon monitoring adherence to rules are difficult to implement in the health care sector as they rely upon access to information which is difficult to gather. Purchasers of health care face fewer problems in accessing information as they can link the provision of this information to financial payment. Placing much of the responsibility for regulation upon active purchasing organizations is therefore a desirable strategy.

Recommendation 3: Those who are currently not covered by a health insurance scheme have no effective purchaser for them. The Thai government should try to bind such individuals into purchasing schemes. Although one approach would be to expand existing health insurance schemes to cover this group, this may not be necessary. By restructuring how government funds are spent, existing funds may perhaps be used to bring about more effective purchasing.

Whilst the Social Security Organization in Thailand has received extensive external technical assistance to develop capacity in information collection and processing it is entirely dependant upon contractor hospitals being able to provide it with this information. Hospital information systems in private hospitals vary considerably but are commonly very weak indeed. Much of the

data needed by the purchasing agent, and indeed much of the data desirable for this study, are not available at the hospital level. Where management has put information systems in place within hospitals, these rarely provide incentives for physicians to give accurate information.

Recommendation 4: Greater attention needs to be paid to building accurate information systems within public and private hospitals, which offer benefits to hospital management, staff and purchasing authorities.

10.4.2 Strengthening the Regulatory Process

In Thailand the Ministry of Public Health should ensure structural quality through the registration process and facility inspection, and the Medical Council should police procedural aspects of quality through its complaints mechanisms. However a number of weaknesses are evident in this system. First the Medical Licence Division grants registration to private facilities on the basis of very little information, and inspection criteria are similarly crude, focusing on factors such as the space per bed and adequate toilet facilities. These are the very factors which consumers can easily judge for themselves. Other factors far more important for the quality of clinical care and much harder for the consumer to judge, such as nurse staffing ratios are not considered. The annual Health Resource Survey asks hospitals for much of the information required to examine relevant aspects of quality of care. However in the past the survey has been accorded low priority, follow-up has been poor and response rates very low. The information collected in the survey is necessary not only as part of monitoring by the MOPH but also potentially to pass on to consumers to help them make more informed choices.

Recommendation 5: Completion of the Health Resource Survey should be linked to re-registration of facilities. Only those facilities which complete and provide accurate information on the health resource survey should be allowed to re-register.

The consumer survey completed as part of this study showed a fairly high rate of dissatisfaction with both public and private hospitals. Much of this dissatisfaction was with factors such as waiting time and the politeness of staff; issues which do not require Medical Council attention, however several respondents, in this small scale survey, also alleged improper medical practice (including incorrect diagnoses and the provision of unnecessary services), yet the number of complaints which come before the Medical Council each year is minuscule. It is the responsibility of the MOPH to ensure that the Medical Council does fulfil its mandate and makes available to the public an effective complaints mechanism.

Recommendation 6: The MOPH in Thailand should more actively monitor the Medical Council and ensure that it provides an effective and accessible mechanism for complaints to be heard and wrongs redressed.

The consumer survey also indicated that many patients felt reluctant to ask the price of care. Thai regulation states that in all hospitals (both public and private) an up-to-date price list should be displayed. Despite the fact that this is the type of regulation which could be relatively easily enforced it is widely flouted.

Recommendation 7: The Medical Registration Division in Thailand should ensure that all hospitals do display a price list as set out in existing regulations.

10.4.3 Market structure

Recent literature on competition in hospital markets (Zwanziger et al 1994) emphasizes that in order for a strategy of purchaser-led competition between providers to be successful two conditions must prevail, (i) there should be alternative providers from which purchasers can buy care and (ii) these alternative providers should have excess capacity. The hospital market in Bangkok more than fulfils both of these conditions and thus organized purchasers should be able to bring about substantial efficiency improvements in the provision of health care.

Without active purchasers, the presence of multiple competing providers, operating at low capacity can be problematic. Health policy in Thailand, and in many developing countries implicitly acknowledges this. Countries often have target ratios for hospital beds per head of the population, suggesting that once this target has been met there are limited benefits to further hospital bed provision. Hospital concentration may also have a direct impact on quality of care; if hospitals are operating at low capacity then they are unable to move down the learning curve as there is likely to be low utilization of specialist services, this in turn may give rise to poor clinical outcomes.

US experience warns of the problems in trying to limit investment in health care though regulatory approaches (Joskow 1980), but in Thailand government has not only neglected the issue of potential over-supply but has actively encouraged further supply of services. In Bangkok the Board of Investment (BOI) has played a critical role in the development of the private hospital sector. BOI support provided corporate tax holidays for periods of up to five years, waivers for import taxes and various other fiscal advantages. Such support has been extended to new hospitals and to hospitals expanding their facilities. BOI activities were

undertaken with very limited reference to the MOPH, and the BOI is at least partially responsible for the current over-supply of hospital beds in Bangkok. In addition close links between government and some private sector hospital investors has resulted in tax waivers on certain types of high technology medical equipment (such as CT scanners) whilst import taxes must be paid on regular medical supplies.

Recommendation 8: The Thai government should not subsidize new private providers (either through the BOI or blanket schemes providing tax relief on imports of medical equipment) in areas where the target bed to population ratio has already been surpassed.

Most of the data collected for this study relate to 1992. Since then there has been considerable further expansion in hospital beds. More recent discussions with hospital directors found that many felt they were now facing considerable competition. Moreover a new range of competitive strategies were becoming evident. Increasingly hospitals were attempting to differentiate their product from others by emphasizing a particular sort of service such as a cardiac centre or an alternative birthing centre. Under the Social Security Scheme there is now extensive 'networking' of facilities. Hospitals and clinics of different sizes are linking to provider networks so that insured patients registered at one hospital can seek care throughout the network. This enhances accessibility but may also restrict competition between providers in the manner of a merger or acquisition. Some large hospitals were establishing satellite centres which would channel patients from outside of Bangkok to the parent facility. Such strategies are a form of vertical integration and as such may be anti-competitive. Market structure seems still to be evolving and confronting the Thai MOPH with new regulatory challenges.

One notable feature of the health care market structure in Thailand is the lack of clearly defined referral mechanism from primary to secondary care services. Whilst active purchasers may help relieve the effects of asymmetric information it is unlikely that they can do this fully: appropriately motivated primary care gatekeepers may be an additional strategy which Thai policy makers and health insurance schemes should pilot. Under certain schemes (such as the Civil Servants Medical Benefit Scheme) pilots tests could encourage beneficiaries to register with primary care providers who would then advise as to when it was appropriate to seek secondary level care, assist the insured person to choose between alternative hospital providers, and help monitor the appropriateness of hospital care provided.

Recommendation 9: Thai policy makers and health insurers should pilot schemes using primary care gatekeepers to help guide insured persons choice of hospital and ensure that care received

at the hospital facility is appropriate.

10.4.4 Consumer Information

The smaller proportion of non-profit facilities and less extensive health insurance coverage in Thailand would suggest that quality competition would be of less significance in Thailand than in the US. However the analysis here suggested that quality competition is important. More extensive health insurance coverage than initially anticipated is part of the reason for this, but it is also probable that investing in quality, particularly highly visible quality, is important as a signalling device. To the extent that quality investment brings about real improvements in service quality then it will enhance welfare, but there is likely to be an exogenously costly element to the signal. For example Bangkok is already extremely well supplied with high technology equipment compared to countries and cities of much higher income levels (Nittayaramphong and Tangcharoensathien 1994) and it seems unlikely that further investment in high technology equipment benefits anyone other than the investing hospital.

Educating consumers may change how they make judgements about different health care facilities and thus what sort of signals providers are inclined to make. The consumer survey in Bangkok found that on the whole people were active consumers, seeking out information and giving importance to appropriate variables such as the skills of doctors. However presumably signalling through equipment and facilities remain important because of the difficulty in judging more valued variables. The government may be able to facilitate the exchange process by publishing information on, for example, doctor qualifications, doctor to bed and nurse to bed ratios by hospital. An alternative approach is to encourage the development of accreditation schemes. These have an advantage in that hospitals wish to be accredited and thus have an incentive to disclose information.

Recommendation 10: The government should publish indicators of quality at all public and private hospitals to help consumers make more informed choices between providers. Initially this list of indicators should be a very simple one building upon the data submitted under the Health Resources Survey.

Recommendation 11: The government should give priority to developing hospital accreditation schemes in Thailand as this also allow consumers (and purchasers) to make more informed choices between providers.

10.5 THE POLITICAL ECONOMY OF REFORM IN THAILAND

The foregoing discussion suggests a program of reform in Thailand to strengthen the hand of purchasers and empower consumers further so as to move the market towards a more efficient outcome. There are a number of political economy obstacles to these reforms.

The likely political problems in strengthening the regulatory process should not be underestimated. The data collection methods used in this study attempted to link annual re-registration of private facilities with the collection of detailed information about hospital structural quality, with only limited success. Staff at the Medical Registration Division did not in general feel that they had sufficient power vis a vis private hospital directors and owners to prevent them from re-registering their facility if they had not completed the survey form. This 'capture' of regulatory agencies by the organizations which they are trying to regulate is a relatively commonly observed phenomenon, however in Thailand it is made more complex by the close linkages between public and private health care sectors. The most notable form of this is the fact that many public sector physicians and health policy makers also hold posts, or own, or have financial interests in private hospitals.

Most of the non-stock exchange owned (and some of the publicly quoted) hospitals in Thailand have some physician ownership. It is traditional for government doctors to work during the evening in a private clinic or hospital. The most influential doctors, with high reputations are able to make the most substantial amount from private sector practice. Thus in considering reforms relating to private health care providers in Thailand, the Ministry of Public Health is constantly aware of the reaction which will come from its own staff. Opposition to private sector reforms may result in public sector unrest. Even at very senior levels in the MOPH this overlap between public and private sectors persist; Ministers of Health, and senior policy makers have all maintained significant financial interests in private sector health care whilst occupying posts which required them to formulate policy about the private sector.

Recommendation 12: The Ministry of Public Health should adopt a policy whereby senior policy makers in the Ministry must resign from any posts held in the private health care sector or sell any financial interests they have in the sector when taking up their post.

A further barrier to the implementation of reforms is the tiered nature of health insurance coverage in Thailand. Only the most affluent (or unhealthy) are likely to have private health insurance coverage, but civil servants and parastatal employees have full coverage of expenses

in public hospitals and significant benefits in private hospitals. Whilst the capitation payment under the Social Security Scheme may imply 'fewer frills' in the care provided to those under the Scheme, one hundred percent of costs are covered by the Scheme so long as the insured person uses the facility (be it public or private) with which they are registered. People working in the informal or agricultural sectors, which still constitute the large majority of the population, tend to have lower incomes, less political voice and poorer access to health care.

Reform of the system of health financing in Thailand so as to provide more effective purchasing agents for insured persons may seem to imply a levelling of the different schemes and/or a constraint upon consumer choice. For example provider payment reform of the Civil Servants Medical Benefit scheme is currently under discussion and it would seem to be beneficial to shift the payment arrangements for this scheme on to a basis similar to that for the SSS so as to remove incentives for the excess provision of services. However to the extent that civil servants are perceived to have better benefits than private sector workers covered by social security they would resist such a reform. Similarly the development of procedures for utilization review, or the requirement that second opinions are sought for expensive treatments would most likely seem an unnecessary imposition to most government workers. Opposition to the reforms from these, more privileged groups, therefore seems likely.

Despite the surprisingly high level of insurance identified in the consumer survey, many of the Thai population are currently not covered by any form of health insurance. Extending health insurance coverage to these groups, and thus providing them with an effective purchasing agent, provides even greater challenges as this exercise would be costly and might also imply some kind of levelling between health insurance schemes.

Consumer education may help lower the opposition to reform, although it is unlikely to remove it altogether. As in many developing countries more medicine is often viewed by the consumer as better medicine, and name-branded products as better products than generic ones. Given the likely physician opposition to reform it seems necessary to at least create allies of consumers so that they appreciate that establishing strong purchasing agents is entirely in their interest.

Recommendation 13: Consumer education campaigns advising consumers of the potential problems associated with over-consumption of certain health care services (ie X-rays and drugs), scope for the provision of unnecessary services, and the advantages of generic drugs should be run, as the government ties to strengthen the purchasing role of insurance schemes.

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LIST OF APPENDICES

Appendix 1
Description of Main Insurance and Medical Benefit Schemes in Thailand

In Thailand there are a number of medical benefit schemes providing free health care services to priority or vulnerable groups within the population, such as the young, the old and the indigent, however these schemes only provide access to public sector providers and have quite restrictive conditions associated with them. They are not discussed here. Instead the focus is upon health insurance schemes. Five types of schemes are identified and discussed.

i. The Civil Servants' Medical Benefit Scheme (CSMBS)
This scheme caters only for government employees (both current and retired) and their dependants (spouse, parents and up to three children). The number of dependants actually covered by the Scheme is unknown and hence the estimate of the total number of people covered under the Scheme (6.4m in 1992) is a fairly conservative estimate based upon the number of current and retired civil servants. In terms of population coverage the CSMBS is the largest of the health insurance schemes.

Payment is made on a fee-for-service basis. For care received in public hospitals by civil servants and their dependants the scheme is billed directly. For care received in private hospitals the civil servant must request reimbursement from the Scheme based upon the hospital invoice. Differential rates of reimbursement are accorded to public and private sectors encouraging people to use public providers. However there is extensive private sector use under the Scheme which is normally associated with significant co-payment. The routine records for the Scheme, contain information on charge by different categories of fee, diagnosis, length of stay, hospital and patient characteristics (ie. sex, department where the civil servant is employed, and whether the patient was the employee him or herself, or a dependant). There is no reimbursement under the Scheme for outpatient care sought in the private sector.

The CSMBS is operated from the Ministry of Finance (MOF). Until recently the MOF has been a very passive purchaser of care. Claims are not computerized and hardly analysed. However the spiralling costs of care under the CSMBS are beginning to become a matter of concern and during the past couple of years discussions between the MOF and MOPH have taken place about the future of the Scheme.

ii. The Social Security Scheme (SSS)
The Social Security Scheme established in 1991 provides a number of benefits including medical care to formal sector workers in Thailand. It covers the employee him or herself only and does not cover dependants. During the first three years of the Scheme all employers with twenty or more employees were covered. It is planned to extend this to all formal sector employees. In 1993, about 3 million workers were covered by the Scheme.

Premiums are shared between insured persons, their employers and the government with each contributing 1.5% of the insured person's salary. For the bulk of medical care, payment is made on a capitation basis to the insured person's main contractor hospital. Since the start of the Scheme the annual capitation payment has remained at 700Baht. The main contractor hospital should have at least 100 beds and meet certain other requirements laid down by the SSS. This hospital may then sub-contract certain services to a lower level facility and/or supra-contract

services to a more sophisticated hospital. Increasingly networks of providers are forming. In addition to services paid for under capitation there are separate funds to cover maternity care and emergency services.

The Maternity fund under the Social Security Scheme
The maternity benefit under SSS is the only benefit which covers dependants (spouses) as well as the employees. As it covers persons who are otherwise uninsured and may actually be resident in different areas from their spouses it was decided not to pay for this benefit through the capitation scheme. Instead a lump sum payment of Baht 2500 is paid to each woman for the delivery of her first and second child. The woman claims this amount from the Social Security office. It is not necessary for the woman to present proof of payment in order to claim this amount, but nonetheless many do.

The Emergency fund under the Social Security Act
This is designed to cover emergency cases where insured persons are unable to reach their main contractor hospital. Under this circumstance they may seek care from any provider but are subsequently reimbursed up to a limited ceiling. There is extensive co-payment for most emergency care sought. The fund does not differentiate between public and private providers.

iii. The Workmen's Compensation Fund (WCF)
The WCF covers the cost of care for illnesses and injuries incurred as a result of employment. Only formal sector employees are covered. Patients may seek either public sector or private sector care and are fully reimbursed up to a ceiling of B30,000 (approximately £670). Only a minority of cases cost more than this. Routine records contain essentially the same information as those under the CSMBS.

iv. Private Health Insurance
Private health insurance has expanded considerably during the past 5-7 years but still remains a relatively minor source of health care finance. At present it seems largely to serve as supplementary insurance for people already covered by social security, or as a means of cover for those who do not fall under the Social Security Scheme. Health insurance is offered in association with life insurance by a number of companies and six local companies specialize in health insurance alone. Companies normally offer a range of packages including different benefits. The mean premium per insured person under a health insurance company in 1988 was Baht 1,379 and the average reimbursement was B588.

v. Employer based health insurance schemes
When this research was initiated very little was known about employer based schemes. Although it was known that such schemes existed amongst certain white collar workers (such as bank workers) the extent of coverage was unknown and no studies had explicitly addressed the phenomenon. Moreover it was assumed that with the establishment of the Social Security Scheme, employer based schemes would gradually die out. In fact as this research and other more recent research suggests this is not the case (Panichpathompong 1994). In order to attract and retain white (and sometimes blue) collar employees many firms have now established their own employer based health insurance scheme in addition to the SSS.

Appendix 2
1993 Private Hospital Survey

1. Objectives

In this survey the researchers ask for information about hospital beds, human resources and throughput. This information is requested in order to help formulate policy on private hospitals and improve coordination between public and private sectors. There are five categories of information requested.

1. Personnel, both full time and part time
2. The number of beds over the years 1990, 1991, 1992
3. Hospital throughput over the years 1990, 1991, 1992
4. Supply of preventive services
5. Fee exemption policy

2. The respondent

The respondent should be the director of the hospital

3. Time frame

Information is requested for calendar years 1990, 1991 and 1992.

4. Agencies responsible

This survey is a collaborative piece of work between the Medical Licence Division, the Health Statistics Division and the Health Planning Division, of the Ministry of Public Health.

5. Content of the form

The form has 5 parts:

Part 1 - Basic information
Part 2 - Human resources
Part 3 - Hospital beds
Part 4 - Throughput
Part 5 - Exemption policy

Part 1 - Basic Information

This part of the form duplicated the form usually filled out by the private hospitals when registering at the Medical Licence Division. The objective of including this (where information was already available) was to add weight to the form and encourage private hospitals to take it seriously.

Part 2 - Human resources

1. Personnel employed during the year 1992

A full time employee is anyone who works a minimum of 40 hours per week in your establishment (including lunch breaks etc). A part time employee is anyone who works less than 40 hours per week.

Type of personnel	Number of Full time	Number of Part time
1. Doctors		
2. Dentists		
3. Dental assistant		
4. Dental nurse		
5. Pharmacist		
6. Pharmacist assistant		
7. Registered nurse		
8. Technical nurse		
9. Practical nurse		
10. Midwife		
11. Nutritionist		
12. Medical technician		
13. Asst medical technician		
14. X-ray technician		
15. X-ray assistant		
16. Physical therapist		
17. Occupational therapist		
18. Health educationist		
19. Medical statistician		
20. Social worker		
21. Nurse assistant[1]		
22. Laboratory technician[1]		
23. Other		

[1] Although there is an official MOPH training for these cadres it is most common for private hospitals to train their own staff to do these jobs. However it was decided against asking explicitly 'number of self trained nurse assistants' etc, because strictly speaking such self-training is illegal and therefore hospitals may underreport (or not report at all) the number of such staff.

2. Number of doctors by specialty, employed during the year 1992.

Specialty	Part time	Full time
1. General practitioner		
2. Pathologist		
3. Anatomical pathologist		
4. Clinical pathologist		
5. Internal medicine		
6. Haematologist		
7. Gastroentorologist		
8. Cardiologist		
9. Chest medicine		
10. Neurology		
11. Dermatology		
12. Psychiatrist		
13. General surgeon		
14. Orthopaedic surgeon		
15. Neuro surgeon		
16. Urologist		
17. Plastic surgeon		
18. Paediatric surgeon		
19. Anal-rectal surgeon		
20. Thoracic surgeon		
21. OB/GYN		
22. Paediatrics		
23. Radiologist		
24. Diagnostic radiologist		
25. Radiology therapist		
26. Nuclear medicine		
27. Anaethatology		
28. Opthamology		
29. ENT		
30. Forensic		
31. Physiatrist		
32. Public health specialist		
33. Other		

3. Staff summary over the years 1990 - 1992

	1990		1991		1992	
	full time	part time	full time	part time	full time	part time
1. Doctors						
2. Professional registered nurse						
3. Technical nurse						
4. Pharmacist						
5. Dentist						

Part 3 - Hospital Beds

4. Beds available over the years 1990 - 1992

	1990	1991	1992
1. General beds			
2. Observation beds			
3. Private beds			
4. ICU beds			
5. Operating theatre beds			
6. Delivery beds			

Part 5. Private and semi-private beds: charge per night in 1992

Type of bed	No. of rooms	Baht per bed per night[2]
1. Semi-private beds		
___ beds per room		
___ beds per room		
___ beds per room		
2. Private single rooms[3]		
Type of room_____		
Type of room_____		
Type of room_____		

[2] **Excluding food**

[3] Private hospitals will frequently have different categories of single bedded rooms: superior, deluxe, VIP etc.

Part 4 - Hospital Throughput

6. Patient statistics 1990-1992

	1990	1991	1992
1. Number of outpatient visits			
2. Number of inpatient admissions			
3. Number of hospital days			
4. Number of ICU cases			
5. Number of surgical cases			
6. Number of deliveries			
7. Number of Caesarian sections			

7. Preventive care provided during 1992

	1992
1. Number of BCG immunizations	
2. Number of Polio virus immunizations	
3. Number of ANC visits	
4. Number of Family Planning visits	
5. Number of dental check-ups	

Part 5 - Exemption Policy

8. Does your hospital have any policy to exempt, either partially or fully, those with a low income?

[ ] Yes

[ ] No

If yes, how many % of your total patients were exempted during 1992?

	Outpatient	Inpatient
1. Totally exempted		
2. Partially exempted		

Appendix 3
Data Sheet used for collection of price data from CSMBS

Data enterers name:_____ Pg No: _____

Govt Dept: _____

Claim ID	Case No.	Hospital	Claimant		Patient					Sex	Dx	LOS	Drugs	IV Fluid	Blood	Investigation	Special Investigation	Medical Appliances	Operation	Anaesthetic	Room & food	Doctor Fee	Others
			Current	Pensioner	Current	Pensioner	Parents	Spouse	Child														

Appendix 4
Construction of IP price index based upon trimmed mean price

Matrix 1 - Trimmed mean price by hospital by diagnosis

	Appendicitis	N	Normal deliver	N	Gastritis	N	Cerebral Thrombosis	N	Dizziness	N	Hypertension	N	Peptic Ulcer	N	Diarrhoea	N	Bronchitis	N	Diabetes	N	Pneumonia	N
KLUAY NAM THAI	13118	1	12345.36	3.00							8576.55	11			7555.50	2			8718.00	2		
KARUNA PITAK	12400	1													1731.00	1						
BANGBORN HOSPITAL															1153.33	6						
VICHAYUDHT	22722	1	24457.50	4.00			15090.25	4	3077.00	2			15648.00	1	1244.00	1						
BANGJARK POLYCLINIC			2899.00	1.00																		
PETCHKASEM BANGKAE									550.00	1	2800	1	627.00	1	6214.00	2			5470.00	1		
PATANAVEJ			1767.00	1.00									620.00	1								
BANGMOD			6750.00	2.00											2932.50	2	2970	1				
BANGNA			6565.00	1.00							6286	1			5482.00	1			2986.00	1	4150	1
SOOKSAWAT POLYCLINIC																						
RATBURANA					3219.00	1									2600.67	3	2669	1			9333.5	2
ROMSAI POLYCLINIC											630	1			687.50	2			8160.00	1		
MAYO HOSPITAL			17699.25	12.00	4535.71	7	10211.67	3	3197.80	5	6387	8	5449.00	3	3720.12	33	4966.64	14	6598.50	4	6062	3
BANGKOK CHRISTIAN	8667	1	11159.25	4.00					1077.00	1			6474.00	1	2984.83	6	4948	1	16138.67	3	5299	1
SRIWICHAI			25410.00	1.00	1990.00	4	6465.00	2	2666.17	6	1910	4	2146.67	3	2048.00	16	2200	2	2210.00	1		
SRIWICHAI 2							7700.00	1					2250.00	1	1982.50	2			3590.00	1		
PASICHAROEN																	7220	2	3731.00	1	8220	1
PAOLO MEMORIAL	17260	2	9991.33	3.00	3663.22	9	6350.80	5	4800.00	1	8173.66	6	6375.57	8	6400.36	11	9618	7	12348.10	10	13146.5	4
BANGPAI HOSPITAL			10778.50	2.00	3932.50	2	4017.00	1	4582.00	1	4045	2			2657.25	8			14790.00	1	5674.4	5
BANGPAKOK HOSPITAL									1720.00	1												
PETCHARAVEJ	18521	1	30000.00	1.00	5054.00	1	5513.00	1	5037.00	1	8013	1			5929.40	5	7021	2	47860.00	1	11474.75	4
KRUNGTHON	18404	3	22781.33	3.00			2468.00	1	3574.67	3					10441.00	2	5319	4	9902.00	4	12820.67	3
PATPANYA											3634	2			3817.00	1						
KASEMRAJ	10390	1	9335.00	6.00					2405.00	2	2093.33	3	5311.67	6	2681.84	19	4739	3	10332.00	2	1758	1
VIBAWADI	20068.67	3	22832.67	3.00	7440.00	2	12783.50	2			3199	1	12467.00	3	4519.33	12	6638.67	3	15471.40	5	24862	2
ST LOUISE	14044	4	21269.33	6.00	7761.00	2	12937.00	1					7118.00	1	4229.00	1	8729	1	8081.67	3	5592.75	4
BAMROONGRAJ	24523	1	25658.50	6.00			19196.00	2					15083.00	1	25254.00	3	22392.5	2			56082	1
CAMILLIAN			12713.00	2.00	2850.00	1	18284.00	1	1780.00	1	1070	1	9707.00	2	3596.67	3			11443.50	2		
BANGKUNTIEN															6000.00	1						
LADKABANG			3064.00	5.00	1330.00	1																
RAMA SOOKSAWAT	16710	1									4212.5	2			3370.00	1						
BANGPHO HOSPITAL					6382.00	3	14727.25	4	6016.75	4					2998.00	6			8630.67	3		
PHYATHAI 1	22158.4	5	22325.43	23.00	3235.00	2	16485.00	2	4617.50	2	12872.25	4	16588.75	4	6962.59	17	10779.17	6	17940.42	12	15997.67	6
PHYATHAI 2	19095	5	18782.33	12.00	22104.00	2	45805.00	1	9922.50	4	14182.8	5	4000.00	1	7140.94	18	5537.5	2	25721.47	15	7163.33	3
MISSION			4610.90	10.00			8453.50	2			3712	2	3486.00	1	7219.40	5	6870.33	3	6841.00	2	38470	1
BANGKOK HOSPITAL	8277.66	3	20080.07	27.00			13522.50	2	6810.00	1					5251.80	5	20262	3	21941.00	4	19781	2
YAOWARAK			17000.00	1.00			2936.67	3	2150.00	2	2274.67	3			3955.00	5	2960	1	11025.00	2	2940	1
SIAM HOSPITAL	15236	4					21675.00	1	5873.00	2	7265.5	2	10620.00	1	4279.25	4			18015.00	2		1
DECHA											22864	1	5764.00	2	12438.00	2					18835	1
SUKHUMVIT	13949.5	2	16524.50	4.00			5219.00	1	5522.50	4	3511	1			4744.75	4						
ANANT PATANA									1382.00	2	12712	1	4429.00	1	1793.50	2						
HUAACHIEW	10703.86	7	8666.23	34.00											2203.75	4	4162	2	4564.25	4	1601	1
RAM KAM HAENG	15715.6	5	15301.60	6.00	3822.50	2			5182.60	5	6739	4	2422.00	1	5063.00	11	7819	1	12587.00	5	9706.67	3
THONBURI	18894.8	5	16940.00	5.00	3109.00	1	22584.50	10	5164.88	8	11183.67	6	9447.00	2	9140.68	22	5201.57	7	15626.56	16	11820.5	8
PROMIT			32631.00	1.00			9867.00	1							6377.00	1	9810	1				
MAHESAK	26009	1									6449	1			898.00	1			11000.40	5		
MITAPAAP													1733.33	3	2280.00	2			5550.00	1		
YANHII PC					2610.00	1					3992.5	6	8045.00	1	1936.00	5						
SAMITIVEJ	29811.00	1	58333.00	2.00	7977.00	1					11106	1	8599.00	1	5847.50	2			41029.25	4	28244.33	3
CHONOCHIN																	1520	1				
BANGPAKOK POLYCLINIC	8900.00	1			5000.00	1	2210.00	1	1196.67	3	9361.67	3			1553.33	6			1695.00	2	2320	1
SAENAVECHAKAN											870	1			1070.00	1	2850	1			780	1
HUAYKWANG					993.33	3					1800	2			950.00	2					1450	1
WICHANYUDHT															710.00	1						
KLONGTON																	1794	1				
DOWKHANONG											1756	3			430.00	1						
CHAOPHRYA	15472.00	1					3400.00	1							5240.00	1						
NAN-AR			8000.00	1.00											2170.00	1						
YOTSAE															6380.00	1						
MITAPAP															3890.00	1						
TOTAL	400450.49		516671.08	192.00	97008.26	46.00	287901.64	53.00	88305.04	62.00	193682.10	90.00	164410.99	50.00	232154.29	275.00	168996.38	72.00	389997.86	120.00	323585.07	65.00
MEAN IN GROUP	16685.44		16145.97		5105.70		11995.90		3839.35		6247.81		6850.46		4464.51		6759.86		12580.58		12445.58	

Appendix 4 - continued

Matrix 2 - ratio of hospital mean price to group mean price, and ip price index

	Appendicitis	Normal deliver	Gastritis	Cerebral Thrombosis	Dizziness	Hypertension	Peptic Ulcer	Diarrhoea	Bronchitis	Diabetes	Pneumonia	IP index	No of Number c diagnoses
KLUAY NAM THAI	79	76				137		169		69		106.18	5
KARUNA PITAK	74							39				56.54	2
BANGBORN HOSPITAL								26				12.92	1
VICHAYUDHT	136	151		126	80		228	28				124.98	6
BANGJARK POLYCLINIC		18										17.95	1
PETCHKASEM BANGKAE					14	45	9	139		43		50.19	5
PATANAVEJ		11					9					10.00	2
BANGMOD		42						66	44			50.48	3
BANGNA		41				101		123		24	33	64.23	5
SOOKSAWAT POLYCLINIC												ERR	0
RATBURANA			63					58	39		75	58.94	4
ROMSAI POLYCLINIC						10		15		65		30.11	3
MAYO HOSPITAL		110	89	85	83	102	80	83	73	52	49	80.66	10
BANGKOK CHRISTIAN	52	69			28		95	67	73	128	43	69.32	8
SRIWICHAI		157	39	54	69	31	31	46	33	18		53.06	9
SRIWICHAI 2				64			33	44		29		42.49	4
PASICHAROEN									107	30	66	67.50	3
PAOLO MEMORIAL	103	62	72	53	125	131	93	143	142	98	106	102.58	11
BANGPAI HOSPITAL		67	77	33	119	65		60		118	46	73.00	8
BANGPAKOK HOSPITAL					45							44.80	1
PETCHARAVEJ	111	186	99	46	131	128		133	104	380	92	141.05	10
KRUNGTHON	110	141		21	93			234	79	79	103	107.42	8
PATPANYA						58		85				71.83	2
KASEMRAJ	62	58			63	34	78	60	70	82	14	57.80	9
VIBAWADI	120	141	146	107		51	182	101	98	123	200	126.93	10
ST LOUISE	84	132	152	108			104	95	129	64	45	101.41	9
BAMROONGRAJ	147	159		160			220	566	331		451	290.52	7
CAMILLIAN		79	56	152	46	17	142	81		91		82.96	8
BANGKUNTIEN								134				134.39	1
LADKABANG		19	26									22.51	2
RAMA SOOKSAWAT	100					67		75				81.02	3
BANGPHO HOSPITAL			125	123	157			67		69		108.05	5
PHYATHAI 1	133	138	63	137	120	206	242	156	159	143	129	147.90	11
PHYATHAI 2	114	116	433	382	258	227	58	160	82	204	58	190.30	11
MISSION		29		70		59	51	162	102	54	309	104.52	8
BANGKOK HOSPITAL	50	124		113	177			118	300	174	159	151.85	8
YAOWARAK		105		24	56	36		89	44	88	24	58.23	8
SIAM HOSPITAL	91			181	153	116	155	96		143		133.62	7
DECHA						366	84	279			151	220.01	4
SUKHUMVIT	80	102		44	144	56		106				88.70	6
ANANT PATANA					36	203	65	40				86.07	4
HUAACHIEW	64	54						49	62	36	13	46.32	6
RAM KAM HAENG	94	95	75		135	108	35	113	116	100	78	94.91	10
THONBURI	113	105	61	188	135	179	138	205	77	124	95	129.06	11
PROMIT		202		82				143	145			143.08	4
MAHESAK	156					103		20		87		91.66	4
MITAPAAP							25	51		44		40.16	3
YANHII PC			51			64	117	43				68.96	4
SAMITTIVEJ	179	361	156			178	126	131		326	227	210.44	8
CHONGCHIN									22			22.49	1
BANGPAKOK POLYCLINIC	53		98	18	31	150		35		13	19	52.20	8
SAENAVECHAKAN						14		24	42		6	21.58	4
HUAYKWANG			19			29		21			12	20.30	4
WICHANYUDHT								16				15.90	1
KLONGTON									27			26.54	1
DOWKHANONG						28		10				18.87	2
CHAOPHRYA	93			28				117				79.48	3
NAN-AR		50						49				49.08	2
YOTSAE								143				142.90	1
MITAPAP								87				87.13	1

Note: Hospital for which there were observations on less than four diagnoses were excluded from the analysis.

Appendix 5

Q'NAIR NUMBER

SURVEY OF
CONSUMER KNOWLEDGE AND PERCEPTIONS OF HEALTH CARE PROVIDERS IN BANGKOK, AND HEALTH CARE SEEKING BEHAVIOUR.

INTRODUCTION FOR RESPONDENT

We are doing a study exploring people's health care seeking behaviour and their preferences over different types of health care, particularly hospital care. The information from this study will be used to help inform the policy of the Ministry of Public Health and thus improve the provision of health care services in Bangkok.

We would like to ask you a few questions about the factors you consider when seeking health care, and what you think of hospitals in Bangkok. It will take about 30 minutes to complete the questionnaire and any answers you give will, of course, be strictly confidential.

This is a collaborative piece of work between:-
the Health Services Research Institute,
the Health Policy Bureau
and
the London School of Hygiene and Tropical Medicine.

Please return this questionaire to:-

_____

by _____.

1. HOSPITALS CHARACTERISTICS VALUED BY CONSUMERS

1.1 Imagine that you have a minor accident at home, for example you cut your hand with a knife and need outpatient care for some stitches, how important would each of these characteristics be when you chose which hospital to go to. Can you rate the importance of different characteristics on a scale of 1 (for very important) to 5 (not at all important) and circle the appropriate number:

	very imp.	quite imp	imp	not imp	not at all imp
1. Ease of access	1	2	3	4	5
2. Comfortable surroundings	1	2	3	4	5
3. A doctor who clearly explains the treatment	1	2	3	4	5
4. A competent doctor	1	2	3	4	5
5. Sympathetic and polite nursing staff	1	2	3	4	5
6. Inexpensive care	1	2	3	4	5
7. Prompt service	1	2	3	4	5
8. Someone you know who works there	1	2	3	4	5
9. A hospital with modern equipment	1	2	3	4	5

1.3 Now imagine that you need to go to hospital for an operation, for example an appendicitis. How important would each of these factors be in your choice of hospital (please circle the appropriate response:

	very imp.	quite imp	imp	not imp	not at all imp
1. Ease of access	1	2	3	4	5
2. Comfortable surroundings	1	2	3	4	5
3. A doctor who clearly explains the treatment	1	2	3	4	5
4. A competent doctor	1	2	3	4	5
5. Sympathetic and polite nursing staff	1	2	3	4	5
6. Inexpensive care	1	2	3	4	5
7. Prompt service	1	2	3	4	5
8. Someone you know who works there	1	2	3	4	5
9. A hospital with modern equipment	1	2	3	4	5

1.3 *This question should only be answered by women*

If you were to become pregnant, and wanted to deliver the baby in hospital, how would you rate each of the following factors when deciding which hospital to use?

	very imp.	quite imp	imp	not imp	not at all imp
1. Ease of access	1	2	3	4	5
2. Comfortable surroundings	1	2	3	4	5
3. A doctor who clearly explains the treatment	1	2	3	4	5
4. A competent doctor	1	2	3	4	5
5. Sympathetic and polite nursing staff	1	2	3	4	5
6. Inexpensive care	1	2	3	4	5
7. Prompt service	1	2	3	4	5
8. Someone you know who works there	1	2	3	4	5
9. A hospital with modern equipment	1	2	3	4	5

1.4 Now imagine that you really did cut your hand in a domestic accident and needed to go to hospital, which hospital would you go to?

_____

Why? (Please enter up to three reasons and prioritize them 1, 2, 3)

[ ] 1. Ease of access
[ ] 2. Comfortable surroundings
[ ] 3. A doctor who clearly explains the treatment
[ ] 4. A competent doctor
[ ] 5. Sympathetic and polite nursing staff
[ ] 6. Care which is not expensive
[ ] 7. Prompt service
[ ] 8. Someone who works there
[ ] 9. Modern equipment
[ ] 10.Other (please specify) _____

1.5 Imagine that you were at home and were experiencing severe abdominal pain for a number of hours, and needed an appendicitis operation which hospital would you actually go to?

_____

Why? (Please enter up to three reasons and prioritize them 1, 2, 3)

[ ] 1. Ease of access
[ ] 2. Comfortable surroundings
[ ] 3. A doctor who clearly explains the treatment
[ ] 4. A competent doctor
[ ] 5. Sympathetic and polite nursing staff
[ ] 6. Care which is not expensive
[ ] 7. Prompt service
[ ] 8. Someone who works there
[ ] 9. Modern equipment
[ ] 10.Other (please specify) _____

1.6 *This question should only be answered by women.*

If you really were pregnant, which hospital would you choose to have the baby in?

_____

Why? (Please enter up to three reasons and prioritize them 1, 2, 3)

[ ] 1. Ease of access
[ ] 2. Comfortable surroundings
[ ] 3. A doctor who clearly explains the treatment
[ ] 4. A competent doctor
[ ] 5. Sympathetic and polite nursing staff
[ ] 6. Care which is not expensive
[ ] 7. Prompt service
[ ] 8. Someone who works there
[ ] 9. Modern equipment
[ ] 10.Other (please specify) _____

PART 2. KNOWLEDGE OF HOSPITALS IN BANGKOK

2.1 The table below lists 15 hospitals, can you mark 'yes' or 'no' according to whether (i) you have heard of the hospital before (ii) you personally have used the hospital before and (iii) you know of friends or family who have used the hospital.

HOSPITAL	HEARD OF		USED PERSONALLY		FAMILY OR FRIEND USED	
	Yes	No	Yes	No	Yes	No
1. PHYATHAI I						
2. PHRA MONGKUT						
3. CHULALONGKORN						
4. BANGKOK CHRISTIAN						
5. KRUNGHDON						
6. CAMILLIAN						
7. CENTRAL/KLANG						
8. SAMITIVEJ						
9. KLUAY NAMTHAI						
10. RAMKAMHAENG						
11. HUACHIEW						
12. RAMATHIBODI						
13. BAMGROONGRAD						
14. THONBURI						
15. RAJAVITHI						

Even if you have not had direct experience of many of these hospitals, can you tell us, out of the hospitals in the table above:

2.2 Which of these hospitals do you think is the most expensive?

_____

2.3 Which of the private hospitals is the cheapest? _____
2.4 Which has the best doctors? _____
2.5 Which is the most comfortable? _____
2.6 Which is the least comfortable? _____
2.7 Which has the best range of equipment? _____

PART 3. CONSUMERIST BEHAVIOUR

3.1 In the past one month can you recall having heard, seen or read any advertisement for a private hospital?

[ ] No, please go to part 3.2

[ ] Yes, please answer the following questions

3.1.1 Which hospitals was this for?

_____

and which of these is the most familiar?

_____

3.1.2 What was the content of the advertisement?

_____

3.1.3 Where did you see or hear it, was it:-

[ ] on radio
[ ] on television
[ ] in a newspaper or magazine
[ ] on a billboard

3.2 How often have you ever asked someone for advice about which hospital to go to?

[ ] Frequently
[ ] A few times
[ ] Once
[ ] Never (go directly to 3.3)

3.2.1 Who did you ask for advice? (*tick more than one box if necessary)*

[ ]	Mother	[ ]	Other relative
[ ]	Father	[ ]	Colleague
[ ]	Brother	[ ]	Friend
[ ]	Sister	[ ]	Doctor
[ ]	Son	[ ]	Other health personnel
[ ]	Daughter		

3.3 When seeking care in the public or the private sector, do you ask to see the price list or enquire about the price before you seek health care? (please make a tick in the box)

	Public	Private
Yes, ask for price		
No, don't ask		

3.4 When seeking care in the public or private sector, does the hospital inform you of the price of care before you use the service?

	Public	Private
Yes, hospital informs		
No, hospitals doesn't inform		

3.5 Do you regularly seek care from the same hospital?

[ ] No, got directly to 3.6
[ ] Yes, please answer the following questions

If yes

3.5.1 Which hospital is it? _____

3.5.2 If this hospital was to increase its prices by 50% would you continue to go to it?

[ ] Yes
[ ] No
[ ] Depends

3.5.3 If your regular hospital was to change the doctor whom you normally see, would you keep using it?

[ ] Yes
[ ] No
[ ] Depends

3.5.4 If *you were to move away from the locality of your regular hospital* would you keep using it?

[ ] Yes
[ ] No
[ ] Depends

3.6 Have you ever been very dissatisfied with the service you received from a particular hospital?

[ ] No, please proceed to question 3.7
[ ] Yes, please answer the following questions

3.6.1 Which hospital was this? _____

3.6.2 Why were you so dissatisfied?

_____

3.6.3 What did you do about it? (Tick more than one box if appropriate).

[ ] Accept and do nothing
[ ] Complain
[ ] Resolve not to use again
[ ] Change hospitals immediately
[ ] Other, please specify _____

3.6.4 Have you ever been back to this hospital again?

[ ] Yes
[ ] No

3.7 Have you ever felt that you were charged too much for care received at a hospital?

[ ] No, please go straight to question 3.8
[ ] Yes, please answer the rest of question 3.7

3.7.1 Which hospital over-charged you?

_____

3.7.2 What did you do about it? (Tick more than one box if appropriate).

[ ] Negotiate
[ ] Accept and pay as required
[ ] Make a complaint
[ ] Refuse to pay
[ ] Decide never to use the hospital again
[ ] Other, please specify _____

3.7.3 Have you ever used this hospital again?

[ ] Yes
[ ] No

3.8 Have you ever sought a second opinion from another doctor?

[ ] Yes
[ ] No

Please indicate the extent to which you agree or disagree with the statements in 3.9 to 3.14.

3.9 If a relative is diagnosed as having cancer by a general doctor in a public hospital then you should advise them to seek a second opinion.

[ ] Strongly agree
[ ] Agree
[ ] Uncertain
[ ] Disagree
[ ] Strongly disagree

3.10 If a relative is diagnosed as having cancer by a specialist at a University Teaching hospital then you should advise them to get a second opinion.

[ ] Strongly agree
[ ] Agree
[ ] Uncertain
[ ] Disagree
[ ] Strongly disagree

3.11 If a relative is diagnosed as having cancer by a specialist in a private hospital then you should advise them to get a second opinion.

[ ] Strongly agree
[ ] Agree
[ ] Uncertain
[ ] Disagree
[ ] Strongly disagree

3.12 If, some time before her delivery, your sister is told by a general doctor at a public hospital that she should have a Caesarian section as the baby is to big to deliver easily, then you should advise her to seek a second opinion.

[ ] Strongly agree
[ ] Agree
[ ] Uncertain
[ ] Disagree
[ ] Strongly disagree

3.13 If, some time before her delivery, your sister is advised by a specialist in a University teaching hospital that she should have a Caesarian section as the baby is to big to deliver easily, then you should advise her to seek a second opinion.

[ ] Strongly agree
[ ] Agree
[ ] Uncertain
[ ] Disagree
[ ] Strongly disagree

3.14 If, some time before her delivery, your sister is advised by a specialist in a private hospital that she should have a Caesarian Section as the baby is to big to deliver easily, then you should advise her to seek a second opinion.

[ ] Strongly agree
[ ] Agree
[ ] Uncertain
[ ] Disagree
[ ] Strongly disagree

3.15 Please can you tell us how you rate the following elements of health care provided in public and private hospitals, according to the time of day at which you seek service.
Mark the services as:

5 - excellent
4 - good
3 - average
2 - not very good
1 - very poor

	Public	Private
a. Promptness of service		
b. Availability of doctors		
c. Politeness of staff		
d. Promptness of investigation facilities		
a. Promptness of service		
b. Availability of doctors		
c. Politeness of staff		
d. Promptness of investigation facilities		
a. Promptness of service		
b. Availability of doctors		
c. Politeness of staff		
d. Promptness of investigation facilities		

PART 4. PERSONAL DATA

4.1 Sex [ ] Male
[ ] Female

4.2 Which district in Bangkok do you currently stay in?

_____

4.3 What is your occupation? _____

4.4 What is the highest level of formal education which you completed:
[ ] Completed primary
[ ] Completed secondary
[ ] Completed vocational training
[ ] Completed under-graduate training
[ ] Completed graduate training

4.5 Is the total monthly income of your household in the region of:
[ ] Less than B3,000
[ ] B3,000 to B5,999
[ ] B6,000 to B9,999
[ ] B10,000 to B14,999
[ ] B15,000 to B29,999
[ ] More than B30,000

4.6 How old are you? [_ _]years

4.7 Are you covered by any health insurance scheme or medical benefit scheme?
[ ] No
[ ] Yes, if so please indicate the type below (mark more than one if necessary)
[ ] Social security scheme
[ ] Civil servants medical benefit scheme
[ ] Parastatal medical benefit scheme
[ ] Private health insurance
[ ] Free medical card scheme for low income
[ ] Other *(please specify)*
[ ] None

4.8 Would you say that you are:
[ ] very healthy
[ ] quite healthy
[ ] not very healthy
[ ] not healthy at all

4.9 For ambulatory care, how many visits have you made during the last year to:-

A public hospital [_ _]

A private hospital [_ _]

A private clinic [_ _]

4.10 During the past year have you ever been admitted to hospital?

[ ] Yes
[ ] No

If yes then

4.10.1 Which hospital/s were you admitted to:

i._____

ii_____

4.10.2 How many days did you spend in hospital [_ _]

****THANK YOU VERY MUCH FOR YOUR HELP****

Appendix 6
Price indices by private hospital

	IP Index	N*	Normal Del	N	Acute Appendicitis	N	Room	N
BAMROONGRAJ	290.52	7	25658.50	6	24523.00	1	1345	84
DECHA	220.01	4					490	13
SAMITIVEJ	210.44	8	58333.00	2	29811.00	1	1400	70
PHYATHAI 2	190.30	11	18782.33	12	19095.00	5	1015	170
BANGKOK HOSPITAL	151.85	8	20080.07	27	8277.66	3	900	78
PHYATHAI 1	147.90	11	22325.43	23	22158.40	5	993	180
PROMIT	143.08	4	32631.00	1			1000	22
PETCHARAVEJ	141.05	10	30000.00	1	18521.00	1	800	44
SIAM HOSPITAL	133.62	7			15236.00	4	610	54
THONBURI	129.06	11	16940.00	5	18894.80	5	568	245
VIBAWADI	126.93	10	22832.67	3	20068.67	3	587	90
VICHAYUDHT	124.98	6	24457.50	4	22722.00	1	1130	170
BANGPHO HOSPITAL	108.05	5					540	47
KRUNGTHON	107.42	8	22781.33	3	18404.00	3	592	58
KLUAY NAM THAI	106.18	5	12345.36	3	13118.00	1	258	44
MISSION	104.52	8	4610.90	10			525	48
PAOLO MEMORIAL	102.58	11	9991.33	3	17260.00	2	362	156
ST LOUISE	101.41	9	21269.33	6	14044.00	4	630	41
RAM KAM HAENG	94.91	10	15301.60	6	15715.60	5	487	122
MAHESAK	91.66	4			26009.00	1	550	18
SUKHUMVIT	88.70	6	16524.50	4	13349.50	2	550	31
ANANT PATANA	86.07	4					245	21
CAMILLIAN	82.96	8	12713.00	2			481	23
RAMA SOOKSAWAT	81.02	3			16710.00	1	300	8
MAYO HOSPITAL	80.66	10	17699.25	12	41752.00	1	470	214
CHAOPHRYA	79.48	3			15472.00	1	510	7
BANGPAI HOSPITAL	73.00	8	10778.50	2			400	34
PATPANYA	71.83	2					400	20
BANGKOK CHRISTIAN	69.32	8	11159.25	4	8667.00	1	653	46
YANHII	68.96	4					323	28
PASICHAROEN	67.50	3					300	5
BANGNA	64.23	5	6565.00	1			558	8
RATBURANA	58.94	4					300	20
YAOWARAK	58.23	8	17000.00	1			300	31
KASEMRAJ	57.80	9	9335.00	6	10390.00	1	300	126
KARUNA PITAK	56.54	2			12400.00	1	850	5
SRIWICHAI	53.06	9	25410.00	1			300	106
BANGPAKOK POLYCLINIC	52.20	8			8900.00	1	270	28
BANGMOD	50.48	3	6750.00	2			300	11
PETCHKASEM BANGKAE	50.10	5					158	8
NAN-AR	49.08	2	8000.00	1			685	2
HUAACHIEW	46.32	6	8666.23	34	10703.86	7	344	54
SRIWICHAI 2	42.49	4					300	20
ROMSAI POLYCLINIC	30.11	3					300	6
LADKABANG	22.51	2	3064.00	5				
SAENAVEJCHAKAN	21.58	4					250	21
HUAYKWANG	20.30	4					350	11
DOWKHANONG	18.87	2					265	6
PATANAVEJ	10.00	2	1767.00	1			210	30
SOOKSAWAT POLYCLINIC							300	1
BAANMAI							300	1
RAMINTRA							300	3
BANGPAKOW							175	4

N* indicates the number of diagnoses for which data was available.
N denotes the number of cases for which cases were available.

Appendix 7
Principal components Analysis 1 - Scores by hospital

NAME	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8
KWONG SUI HOSPITAL	0.6851	2.1129	-1.9992	-0.2537	-1.1651	0.6343	0.0213	-0.9069
HUACHIEW HOSPITAL	2.0073	1.4686	-0.4492	0.6287	2.3904	-2.4878	-1.3312	-2.4577
SUKHUMVIT HOSPITAL	0.1672	-0.4314	0.8852	-1.6643	0.3991	1.3841	-0.2722	-0.9846
PAATBUNYAR HOSPITAL	0.5016	0.0118	0.0210	0.4785	-0.3430	0.5462	0.7721	-0.7054
PATANAVEJ HOSPITAL	-0.4567	0.3774	-0.4661	0.0349	-0.6645	0.9697	0.1784	-1.3256
SAMITIVEJ HOSPITAL	1.6192	-0.6421	0.0164	-0.1818	-1.2677	0.7648	-0.1580	-0.0753
TEPTHARIN HOSPITAL	-0.1165	-0.9242	-0.8947	0.4812	-1.3608	-1.1447	-0.7364	0.7834
ST LOUIS HOSPITAL	1.4920	0.4491	-0.9116	-1.5596	-0.8211	0.2921	0.5380	0.0742
KARUNA PHITAK HOSPITAL	-0.1340	0.1141	-0.0167	-0.9000	0.0821	-0.5727	-0.2640	-0.9900
BAANMAI POLYCLINIC	-0.9849	1.0626	-0.7067	-0.2107	0.0673	-0.6113	0.9188	-0.3647
RATBURANA HOSPITAL	-0.2993	-0.1939	-0.7516	0.1943	-1.3014	-0.3279	-1.7042	-0.0625
RAMA SUKSAWAT HOSPITAL	-0.8592	0.6058	1.2434	0.0685	0.5157	-1.0684	0.7215	-0.0608
BANGPAKOW POLYCLINIC	-1.4318	1.4806	0.1425	0.3717	1.4580	-0.5201	1.4267	1.8618
BANGKUTIEN HOSPITAL	-0.7340	-0.7066	-0.0182	-0.3147	-0.3241	-1.6083	-1.1013	0.3609
ROMSAI POLYCLINIC	-1.3867	-0.2159	-0.9522	-0.5010	0.1728	0.0628	0.7023	-0.4476
BINTONG POLYCLINIC	-1.1009	1.3512	-0.9819	3.0256	1.8685	0.7479	-0.5837	-0.4647
BANGPAI HOSPITAL	0.3625	0.1890	-0.2781	-0.2964	-1.5900	-0.9571	1.3213	0.0445
PHETKASEM-BANGKAE HOSP	0.1993	1.0726	-0.2774	1.7183	-1.1004	1.4554	-2.0436	0.9087
KASEMRAD HOSPITAL	0.1069	-0.7895	1.0063	0.4605	-0.9485	-0.4596	0.8201	-0.9695
WICHANYUT HOSPITAL	-0.7986	0.1904	0.1081	1.2436	-0.2207	0.9337	0.0065	-1.4616
PASICHALOEN HOSPITAL	-0.4760	0.9500	2.3218	-0.5369	2.0251	1.5226	-0.5145	1.6319
CHIT AMARIN HOSPITAL	-0.9690	-1.2759	0.0707	0.1766	-0.2364	-1.3058	-1.3095	-0.0643
PATANAPAT	-0.5596	0.5123	1.8191	0.1024	-0.3518	-1.6244	0.0267	0.5019
RAMKAMHAENG HOSPITAL	1.0374	-0.9420	0.3171	1.8892	-0.3091	-0.1343	0.4916	-0.8594
BANGNA HOSPITAL	0.0617	-0.9675	0.6724	1.2829	-0.1070	0.2395	2.5074	-0.0465
MISSION HOSPITAL	1.2091	0.3900	-0.1421	-1.1006	0.0745	0.0678	-0.3756	0.0297
BANGPOO HOSPITAL	-0.1272	-1.6503	0.0211	-0.6904	0.7327	-0.0458	-1.7751	1.6158
KRUNTHEP HOSPITAL	2.4505	-0.8976	-1.3863	1.2100	0.7215	0.4795	1.4795	2.4740
KLONGTON HOSPITAL	0.0892	-0.1291	0.8988	0.6900	-1.2767	-0.5843	0.5172	-0.6798
KANARPAAT POLYCLINIC	-1.4036	-0.6555	-0.8431	-0.6601	0.7305	1.2844	0.0117	0.0420
SAHAVEJ POLYCLINIC	-1.4828	-0.3323	-1.5682	-1.0305	0.1239	-0.7612	0.3750	0.1358
CHONGCHIN HOSPITAL	0.1777	1.9892	-1.8055	-0.9448	-0.2130	0.9868	-0.2679	1.5351
DECHA HOSPITAL	0.1429	-0.0265	-0.1616	-1.2684	-0.1972	-0.8815	1.0407	0.9728
PHYATHAI 2	0.9506	-0.8316	-0.5497	-0.4161	1.4619	-0.1641	-2.0505	0.0855
KRUNGDHON HOSPITAL	0.8722	0.0161	1.1295	-1.5303	-0.0210	0.7805	0.1195	-0.1304
YAOWARAK HOSPITAL	-0.1803	1.3745	1.6272	0.3255	-0.9435	-0.9655	-0.0812	0.4668
THONBURI HOSPITAL	1.6194	-0.2322	0.0307	-0.4399	2.2176	-1.0969	1.4464	0.0562
V.S. POLYCLINIC	0.1974	1.7993	2.0449	0.4344	-1.5723	0.1221	-0.8706	1.3755
PAATSIAM POLYCLINIC	-0.6822	0.0737	0.7511	-1.6532	0.5513	1.3328	0.3093	-1.5133
ANANPATANA HOSPITAL	-1.1163	-0.8016	-0.4753	-0.9053	-0.0710	-0.9907	-0.5142	0.0577
MAY YO HOSPITAL	0.9557	-0.5172	1.0845	0.0321	0.1658	1.7594	-0.0772	-0.9474
WIPAWADI HOSPITAL	0.3305	-1.5825	-0.3255	1.0305	0.0895	0.0237	0.1906	1.2196
CENTRAL GENERAL HOSPITA	-0.0859	-1.9088	0.7441	0.6862	0.4123	0.9316	-0.8553	-0.3313
CENTRAL POLYCLINIC	-1.8499	-0.9371	-0.9947	0.4931	0.1456	0.9906	0.9436	-0.3844

Appendix 7 continued
Principal components Analysis 2 - Scores by hospital

NAME	PC1	PC2	PC3	PC4	PC5	PC6
KWONG SUI HOSPITAL	-0.1887	0.9262	-1.8133	-0.4481	-1.3508	0.2483
HUACHIEW HOSPITAL	1.6278	1.5666	-1.5643	1.7871	1.3025	-3.0738
SUKHUMVIT HOSPITAL	0.1956	-0.3590	1.8359	1.1008	-0.9096	-0.7204
PAATBUNYAR HOSPITAL	0.4780	0.2547	-0.1521	-0.2540	0.1854	0.3764
PATANAVEJ HOSPITAL	-0.6008	0.0991	-0.3278	-0.2495	-0.9146	0.6110
SAMITIVEJ HOSPITAL	1.7089	-0.3157	0.1006	-0.8984	-1.4164	1.4005
TEPTHARIN HOSPITAL	0.0817	-1.1148	-0.8185	-1.7089	0.0042	-0.6392
ST LOUIS HOSPITAL	1.0009	-0.2632	0.1093	-0.1300	-0.4474	-0.2744
KARUNA PHITAK HOSPITAL	-0.2168	-0.2034	0.3990	0.1758	-0.0253	-0.6098
BAANMAI POLYCLINIC	-1.2962	0.3347	-0.6480	0.0338	0.4809	1.0855
RATBURANA HOSPITAL	-0.2835	-0.4962	-0.6861	-1.2541	-1.2413	-1.1275
RAMA SUKSAWAT HOSPITAL	-0.8251	0.8976	0.8420	0.0633	1.4456	-0.0748
BANGPAKOW POLYCLINIC	-1.7316	1.1466	-0.2370	1.0719	1.8897	0.4543
BANGKUTIEN HOSPITAL	-0.5207	-0.8740	0.2633	-0.7480	0.5232	-1.8763
ROMSAI POLYCLINIC	-1.4119	-0.9487	-0.2981	0.3093	0.1887	0.6612
BINTONG POLYCLINIC	-1.1921	1.4944	-2.8050	1.3624	-0.0478	0.5159
BANGPAI HOSPITAL	0.1800	-0.0775	0.0303	-1.6328	0.9151	0.3007
PHETKASEM-BANGKAE HOSP	-0.0121	1.3525	-1.2666	-0.8761	-1.9843	-1.1524
KASEMRAD HOSPITAL	0.4354	-0.0916	0.7867	-1.2362	0.8425	0.1465
WICHANYUT HOSPITAL	-0.6915	0.5139	-0.5197	-0.2036	-0.5025	0.5192
PASICHALOEN HOSPITAL	-0.4819	1.6396	1.9612	2.2239	-0.4333	0.1163
CHIT AMARIN HOSPITAL	-0.5369	-1.1741	0.2044	-0.7387	0.4192	-1.9778
PATANAPAT	-0.4604	1.0811	1.2906	-0.9510	1.3728	-1.0165
RAMKAMHAENG HOSPITAL	1.4484	0.0845	-0.7146	-0.8077	0.5791	0.7522
BANGNA HOSPITAL	0.4347	-0.1435	0.2323	-0.5362	1.9262	1.5720
MISSION HOSPITAL	0.9575	0.1231	0.2346	0.4301	-0.7506	0.1034
BANGPOO HOSPITAL	0.3092	-1.5986	0.5771	0.6427	-0.7272	-0.9983
KRUNTHEP HOSPITAL	2.5063	-0.6422	-1.7747	0.5003	0.7760	2.1450
KLONGTON HOSPITAL	0.2839	0.4592	0.3367	-1.5862	0.3171	0.8723
KANARPAAT POLYCLINIC	-1.3160	-1.2605	0.0042	1.1540	-0.7161	0.4917
SAHAVEJ POLYCLINIC	-1.5657	-1.5290	-0.5551	0.1794	0.2926	0.3362
CHONGCHIN HOSPITAL	-0.6848	0.6203	-1.2004	0.5735	-1.3184	0.0513
DECHA HOSPITAL	-0.0106	-0.5190	0.6072	-0.1761	0.9468	0.2417
PHYATHAI 2	1.1246	-0.8648	-0.4288	1.4539	-1.0286	-1.0500
KRUNGDHON HOSPITAL	0.8285	0.2114	1.6506	0.4864	-0.8862	0.9023
YAOWARAK HOSPITAL	-0.3291	1.8631	0.8240	-1.2530	0.4066	-0.1835
THONBURI HOSPITAL	1.5843	-0.0772	0.0674	1.8424	2.1974	-0.0597
V.S. POLYCLINIC	-0.0464	2.5129	1.0592	-1.5531	-0.8796	-0.1322
PAATSIAM POLYCLINIC	-0.6814	-0.1242	1.4648	1.2182	-1.3011	1.8175
ANANPATANA HOSPITAL	-0.9514	-1.3531	0.2746	-0.1862	0.1521	-0.6722
MAY YO HOSPITAL	1.1400	0.2917	1.0116	0.5827	-0.8724	0.0940
WIPAWADI HOSPITAL	0.7741	-1.1271	-0.4985	-0.3054	0.6057	0.1753
CENTRAL GENERAL HOSPITA	0.5710	-1.0133	0.6328	0.2904	-0.4045	-0.6424
CENTRAL POLYCLINIC	-1.6351	-1.3028	-0.4919	0.2514	0.3890	0.2901

Appendix 8
Cluster analysis - Hospitals by cluster number

	Type of Cluster Analysis							
	Including Distance and Age variables					Excluding Distance and Age variables		
NAME	BAV6	BAV7	WAV6	WAV7	: BAV6	BAV7	WAV6	WAV7
KWONG SUI HOSPITAL	1	1	1	1	: 1	1	1	1
HUACHIEW HOSPITAL	2	2	2	2	: 2	2	2	2
SUKHUMVIT HOSPITAL	3	3	3	3	: 3	3	3	3
PAATBUNYAR HOSPITAL	3	3	3	3	: 3	3	3	4
PATANAVEJ HOSPITAL	3	3	4	4	: 1	1	1	1
SAMITIVEJ HOSPITAL	3	3	3	3	: 3	3	3	3
TEPTHARIN HOSPITAL	3	3	4	4	: 1	1	3	4
ST LOUIS HOSPITAL	3	3	3	3	: 3	3	3	3
KARUNA PHITAK HOSPITAL	3	3	3	3	: 3	3	3	4
BAANMAI POLYCLINIC	4	4	5	5	: 4	4	4	5
RATBURANA HOSPITAL	3	3	4	4	: 1	1	3	4
RAMA SUKSAWAT HOSPITAL	5	5	6	6	: 5	5	5	6
BANGPAKOW POLYCLINIC	4	4	5	5	: 4	6	4	5
BANGKUTIEN HOSPITAL	0	3	4	4	: 1	1	3	4
ROMSAI POLYCLINIC	4	4	5	5	: 4	4	4	5
BINTONG POLYCLINIC	4	4	4	4	: 4	6	1	1
BANGPAI HOSPITAL	3	3	3	3	: 3	3	3	4
PHETKASEM-BANGKAE HOSP	5	6	4	4	: 1	1	3	4
KASEMRAD HOSPITAL	3	3	3	3	: 3	3	3	4
WICHANYUT HOSPITAL	5	6	4	4	: 1	1	1	1
PASICHALOEN HOSPITAL	5	5	6	6	: 5	5	5	6
CHIT AMARIN HOSPITAL	5	6	4	4	: 1	1	1	1
PATANAPAT	5	3	6	6	: 5	5	5	6
RAMKAMHAENG HOSPITAL	3	3	3	3	: 3	3	3	3
BANGNA HOSPITAL	3	3	3	3	: 3	3	3	4
MISSION HOSPITAL	3	3	3	3	: 3	3	3	3
BANGPOO HOSPITAL	3	3	3	3	: 3	3	3	3
KRUNTHEP HOSPITAL	6	7	3	7	: 6	7	6	7
KLONGTON HOSPITAL	3	3	3	3	: 3	3	3	4
KANARPAAT POLYCLINIC	4	4	5	5	: 4	4	4	5
SAHAVEJ POLYCLINIC	5	6	4	4	: 1	1	1	1
CHONGCHIN HOSPITAL	1	1	1	1	: 1	1	1	1
DECHA HOSPITAL	3	3	3	3	: 3	3	3	3
PHYATHAI 2	3	3	3	3	: 3	3	3	3
KRUNGDHON HOSPITAL	3	3	3	3	: 3	3	3	3
YAOWARAK HOSPITAL	5	5	6	6	: 5	5	5	6
THONBURI HOSPITAL	3	3	3	3	: 3	3	3	3
V.S. POLYCLINIC	5	5	6	6	: 5	5	5	6
PAATSIAM POLYCLINIC	4	4	5	5	: 4	4	4	5
ANANPATANA HOSPITAL	4	4	5	5	: 3	3	3	3
MAY YO HOSPITAL	3	3	3	3	: 3	3	3	3
WIPAWADI HOSPITAL	3	3	3	3	: 3	3	3	3
CENTRAL GENERAL HOSPITA	3	3	3	3	: 3	3	3	3
CENTRAL POLYCLINIC	4	4	5	5	: 4	4	4	5

Appendix 9
Sample and Response rate for consumer survey

ORGANIZATION	District	No. Distributed	no. Returned	Response Rate
GOVT				
Min. of Foreign Affairs	PH	30	24	80%
Min of Justice	PH	20	19	95%
The National Museum	PH	30	28	93%
Min of Transport	PR	30	28	93%
Dept of Social Welfare	PR	20	17	85%
Nat Statistics Office	PR	30	30	100%
Customs Dept	KT	25	21	84%
Srinakarinvirote Uni.	KT	30	26	87%
Demonstration School S	KT	30	30	100%
Town & Country Planni	HK	30	24	80%
BMA Cleansing Dept	HK	25	18	72%
BMA Social Welfare D	HK	25	24	96%
Mineral Resource Dept	R	30	20	67%
Highway Dept	R	20	19	95%
Rajavithee Orphans Hon	R	30	28	93%
TOTAL GOVT		405	356	88%
PARASTATAL				
Govt lottery	PH	40	39	98%
Public Warehouse Org	PH	35	0	0%
Govt Stationery Office	PH	45	42	93%
Tourist Authority	PR	15	13	87%
Forest Industry Org	PR	25	18	72%
Tobacco Monopoly	KT	30	27	90%
Port Authority	KT	25	16	64%
Tanning Organization	KT	25	25	100%
Mass Communication O	HK	25	25	100%
Govt. Housing Bank	HK	25	22	88%
Bangkok Mass Transit A	HK	25	9	36%
Veterans Assoc.	R	10	8	80%
Industrial Estate Auth.	R	30	27	90%
Express Transport Org.	R	25	24	96%
TOTAL PARASTATAL		380	295	78%

ORGANIZATION	District	No. Distributed	no. Returned	Response Rate
PRIVATE FOR-PROFIT				
Mirama Hotel	PH	25	21	84%
Kamonsukoson Insurance	PH	25	21	84%
Lawyers' Council	PH	25	16	64%
Sahamalayan Bank	PR	25	25	100%
Betaco Farming	PR	25	18	72%
Palitapan mansampalan	PR	25	25	100%
Ital Thai Engineering	HK	25	21	84%
Phisanu Karnchang	HK	25	24	96%
STC Corporation	HK	25	24	96%
B.Grim and Co.	R	25	15	60%
Auto Technique	R	25	25	100%
Erawan Hotel	R	25	22	88%
Asoke Motors	KT	25	18	72%
Group 4 Securities	KT	25	14	56%
Saha Utsahakan Palm O	KT	25	13	52%
TOTAL PRIVATE COMPANIES		375	302	81%
NON-GOVERNMENTAL ORGANIZATIONS				
Assoc for Mental Illness		25	24	96%
Klong Tooey Slum Found.		25	17	68%
Pawtectung Society		25	23	92%
World Vision		25	24	96%
Found. for Children in Need		20	16	80%
Catholic Council for Dev.		20	7	35%
Anti-TB Society		25	0	0%
Thai Volunteers Assoc.		25	12	48%
Pop and Community Dev Fund		25	24	96%
YMCA		25	25	100%
Thai-Japan Tech. Exchange		25	24	96%
People's Rights & Freedoms		20	14	70%
Youth & Children Found.		20	20	100%
Pearl S. Buck Found.		25	24	96%
Catholic Relief Services		25	6	24%
TOTAL NGOs		355	260	73%

GRAND TOTAL

No. distributed	1515
No returned & correct	1213
Response rate	80%

Appendix 10
Pearson correlation coefficients between personal characteristics of sample

	Sex	Income	Education	Age
Sex	1			
Income	-0.1266**	1		
Education	0.0151	0.2753**	1	
Age	-0.1117**	0.6027	0.03092	1

Key
** denotes significant at 0.001 level

Appendix 11

Significance of difference in reasons for seeking care at a particular hospital across scenarios using t-test for two related samples

	FINGER AND APPENDIX			FINGER AND DELIVERY			APPENDIX AND DELIVERY		
	Mean finger	Mean append	t	Mean finger	Mean delivery	t	Mean append	Mean delivery	t
Access	1.41	1.23	8.44*	1.36	1.28	2.84*	1.21	1.28	3.29*
Comfortable	2.45	2.11	13.74*	2.42	1.76	19.85*	2.04	1.76	10.50*
Dr who explains	2.08	1.66	16.84*	1.99	1.45	16.29*	1.57	1.45	5.26*
Skilled doctors	2	1.3	24.56*	1.91	1.19	22.16*	1.25	1.19	3.61*
Sympathetic nurses	2.05	1.96	4.46*	1.99	1.79	7.41*	1.89	1.78	5.31*
Reasonable price	2.16	2.16	0.16	2.19	2.17	0.76	2.19	2.17	0.81
Prompt service	1.65	1.51	7.10*	1.61	1.51	3.49*	1.45	1.51	2.64*
Contact at the hospital	3.55	3.19	12.51	3.51	3.05	12.12*	3.12	3.04	2.46*
Modern equipment	1.83	1.34	20.36	1.73	1.22	18.25*	1.29	1.22	4.12*

Notes:

* indicates significance at 2% level

Explanation of scoring system is given in the text, lower scores suggest the variable is of greater importance

Appendix 12
Number of complaints by hospital compared with proposed utilization by hospital

HOSP NAME	Number complaints	% of all complaints	Proposed utilization N. finghos	N.apphos	N.delhos	Total use	Respondents saying will use as % of all.	Ratio Complaint: Predicted use
Bamroongrad	7	1.4	17	24	19	60	2.12%	0.66
Bangpoo	1	0.2	25	18	6	49	1.73%	0.12
Huachiew	10	2	22	23	45	90	3.18%	0.63
Kluay Namthai	14	2.8	14	17	3	34	1.20%	2.33
Krunghdon	5	1	12	16	4	32	1.13%	0.89
Krungthep Chris	4	0.8	8	13	18	39	1.38%	0.58
Krunghtp	11	2.2	18	32	15	65	2.29%	0.96
Mayo	4	0.8	29	27	7	63	2.22%	0.36
Paolo Memorial	12	2.4	19	22	9	50	1.76%	1.36
Phathai 2	2	0.4	19	29	22	70	2.47%	0.16
Ramkamhaeng	18	3.5	79	66	20	165	5.82%	0.60
Samitivej	5	1	7	8	8	23	0.81%	1.23
Siam	2	0.4	22	14	1	37	1.31%	0.31
St Louis	0	0	20	20	13	53	1.87%	0.00
Sukhumvit	2	0.4	19	10	3	32	1.13%	0.35
Thonburi	10	2	46	59	21	126	4.45%	0.45
Wichaiyudht	1	0.2	20	19	10	49	1.73%	0.12
Wipawadi	6	1.2	27	26	14	67	2.36%	0.51
Phyathai	13	2.6	36	51	55	142	5.01%	0.52
Central/Klang	15	3	12	6	2	20	0.71%	4.25
Chula	44	8.7	22	41	45	108	3.81%	2.28
Lerdsin	5	1	8	8	3	19	0.67%	1.49
Nopparat	5	1	18	14	5	37	1.31%	0.77
Phumipol	6	1.2	19	29	13	61	2.15%	0.56
Police	10	2	8	12	6	26	0.92%	2.18
Pra Mongkut	13	2.6	15	26	17	58	2.05%	1.27
Pra Pin Klao	9	1.8	7	12	5	24	0.85%	2.13
Rajavithi	45	8.9	22	28	56	106	3.74%	2.38
Ramathibodi	67	13.2	26	67	78	171	6.03%	2.19
Siriraj	51	10	53	90	52	195	6.88%	1.45
Taksin	6	1.2	8	4	2	14	0.49%	2.43
Wachira	22	4.3	24	20	12	56	1.98%	2.18
		total	1077	1071	686	2834		

Appendix 13
Reasons given for choosing public and private hospitals, by condition

PRIVATE HOSPITALS

PRIVATE - FINGER	R1	R2	R3	TOTAL SCORE	MEAN SCORE
Access	521	38	19	1658	2.61
Comfort	8	57	57	195	0.31
Dr explains well	7	45	71	182	0.29
Skilled doctors	52	161	72	550	0.87
Sympathetic nursing	7	65	67	218	0.34
Moderate price	4	51	73	187	0.29
Prompt service	23	149	136	503	0.79
Contact at hospital	2	6	8	26	0.04
Modern equipment	6	46	104	214	0.34
Registered hospital	4	3	3	21	0.03
Regular hospital	1	2	0	7	0.01
TOTAL	635			3761	

PRIVATE APPEND	R1	R2	R3	TOTAL SCORE	MEAN SCORE
Access	379	60	38	1295	2.08
Comfort	5	45	45	150	0.24
Dr explains well	6	42	40	142	0.23
Skilled doctors	151	236	76	1001	1.61
Sympathetic nursing	3	25	42	101	0.16
Moderate price	16	35	65	183	0.29
Prompt service	11	72	125	302	0.49
Contact at hospital	15	15	18	93	0.15
Modern equipment	25	85	158	403	0.65
Registered hospital	10	4	7	45	0.07
Regular hospital	1	0	1	4	0.01
TOTAL	622			3719	

PRIVATE DELIVERY	R1	R2	R3	TOTAL SCORE	MEAN SCORE
Access	163	38	41	606	1.41
Comfort	7	41	48	151	0.35
Dr explains well	15	35	38	153	0.36
Skilled doctors	183	128	34	839	1.96
Sympathetic nursing	3	18	33	78	0.18
Moderate price	8	38	57	157	0.37
Prompt service	6	38	40	134	0.31
Contact at hospital	14	20	20	102	0.24
Modern equipment	23	70	106	315	0.73
Registered hospital	6	2	7	29	0.07
Regular hospital	1	1	1	6	0.01
TOTAL	429			2570	

Notes:
R1 denotes the number of people giving this as their primary reason, R2 as their secondary reason and R3 as their third reason. As described in the text three marks were given if the variable was a primary reason, two if it was a secondary reason and one if it was the third reason. The sum of these points is the SCORE and the mean score is simply the total score divided by the number of respondents.

Appendix 13 - continued
Reasons given for choosing public and private hospitals, by condition

PUBLIC HOSPITALS

PUBLIC FINGER	R1	R2	R3	TOTAL SCORE	MEAN SCORE
Access	172	14	9	553	2.43
Comfort	0	17	8	42	0.18
Dr explains well	6	13	27	71	0.31
Skilled doctors	18	50	23	177	0.78
Sympathetic nursing	5	16	8	55	0.24
Moderate price	12	53	53	195	0.86
Prompt service	7	22	35	100	0.44
Contact at hospital	5	10	12	47	0.21
Modern equipment	3	21	29	80	0.35
Registered hospital	0	0	2	2	0.01
Regular hospital	0	1	0	2	0.01
TOTAL	228			1324	

PUBLIC APPEND	R1	R2	R3	TOTAL SCORE	MEAN SCORE
Access	149	18	15	498	2.23
Comfort	0	7	8	22	0.10
Dr explains well	2	14	17	51	0.23
Skilled doctors	51	81	23	338	1.52
Sympathetic nursing	3	8	10	35	0.16
Moderate price	7	20	45	106	0.48
Prompt service	4	23	21	79	0.35
Contact at hospital	2	9	19	43	0.19
Modern equipment	4	36	52	136	0.61
Registered hospital	0	1	1	3	0.01
Regular hospital	1	0	1	4	0.02
TOTAL	223			1315	

PUBLIC DELIVERY	R1	R2	R3	TOTAL SCORE	MEAN SCORE
Access	69	7	13	234	1.63
Comfort	4	9	13	43	0.30
Dr explains well	7	14	10	59	0.41
Skilled doctors	44	49	16	246	1.71
Sympathetic nursing	2	3	19	31	0.22
Moderate price	5	17	12	61	0.42
Prompt service	2	8	12	34	0.24
Contact at hospital	4	8	10	38	0.26
Modern equipment	7	27	32	107	0.74
Registered hospital	0	1	1	3	0.02
Regular hospital	0	0	2	2	0.01
TOTAL	144			858	

APPENDIX 14
SCORES FOR CHARACTERISTICS BY HOSPITAL AND CONDITION

1. FINGER

	BMG	PHYATHAI	RKH	MAYO	CHULA	RAMA	RAJAVITHI	WACHIRA
ACCESS	1.9	1.79	2.73	2.71	1.75	2.30	2.37	2.47
COMFORT	0.8	0.34	0.40	0.38	0.00	0.13	0.32	0.24
DR EXPLAI	0.4	0.36	0.34	0.33	0.25	0.52	0.68	0.47
SKILL DR	1.5	1.28	0.84	1.00	1.63	0.91	0.58	0.94
SYMP NURS	0.6	0.43	0.27	0.19	0.00	0.26	0.21	0.00
CHEAP	0	0.18	0.17	0.38	1.06	0.65	0.58	0.82
PROMPT	0.5	0.87	0.66	0.90	0.38	0.57	0.37	0.47
CONTACT	0	0.10	0.03	0.00	0.38	0.04	0.11	0.53
EQUIPMEN	0.6	0.57	0.47	0.14	0.38	0.48	0.37	0.18
REGIST	0	0.05	0.00	0.00	0.00	0.00	0.00	0.00
REGULAR	0	0.03	0.04	0.00	0.00	0.00	0.11	0.00

2. APPENDICITIS

	BMG	PHYATHAI	RKH	MAYO	CHULA	RAMA	RAJAVITHI	WACHIRA
ACCESS	1.58	1.61	2.59	2.55	1.38	1.24	1.52	2.35
COMFORT	0.74	0.29	0.33	0.40	0.12	0.09	0.00	0.12
DR EXPLAI	0.32	0.26	0.28	0.30	0.18	0.46	0.30	0.35
SKILL DR	1.42	1.95	1.45	1.45	2.09	1.98	1.61	1.47
SYMP NURS	0.37	0.28	0.12	0.10	0.09	0.17	0.09	0.00
CHEAP	0.16	0.08	0.03	0.05	0.88	0.74	0.78	0.59
PROMPT	0.42	0.53	0.40	0.70	0.06	0.15	0.39	0.18
CONTACT	0.00	0.06	0.03	0.00	0.53	0.26	0.26	0.53
EQUIPMEN	1.21	0.87	0.71	0.45	0.71	0.89	0.87	0.41
REGIST	0.00	0.10	0.00	0.00	0.03	0.06	0.00	0.00
REGULAR	0.00	0.00	0.00	0.00	0.00	0.06	0.04	0.00

3. DELIVERY

	BMG	PHYATHAI	RKH	MAYO	CHULA	RAMA	RAJAVITHI	WACHIRA
ACCESS	0.88	1.01	2.33	2.50	0.68	1.03	1.43	3.00
COMFORT	0.69	0.57	0.28	0.50	0.05	0.18	0.23	0.00
DR EXPLAI	0.44	0.26	0.39	0.50	0.78	0.38	0.45	0.44
SKILL DR	2.06	2.10	1.39	1.00	2.16	2.12	1.85	1.00
SYMP NURS	0.25	0.35	0.28	0.00	0.14	0.20	0.17	0.00
CHEAP	0.00	0.05	0.06	0.00	0.65	0.62	0.79	0.78
PROMPT	0.75	0.46	0.44	0.50	0.08	0.14	0.19	0.11
CONTACT	0.00	0.16	0.00	0.25	0.49	0.26	0.53	0.33
EQUIPMEN	0.94	0.90	0.67	0.75	0.78	1.03	0.34	0.33
REGIST	0.00	0.07	0.00	0.00	0.14	0.05	0.00	0.00
REGULAR	0.00	0.00	0.17	0.00	0.00	0.00	0.02	0.00

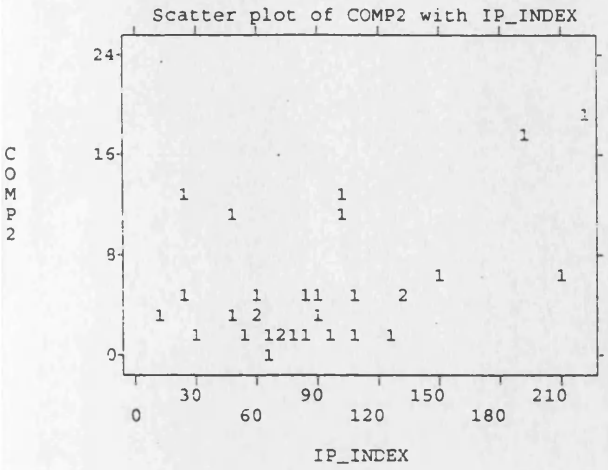
4. MEAN ALL CONDITIONS

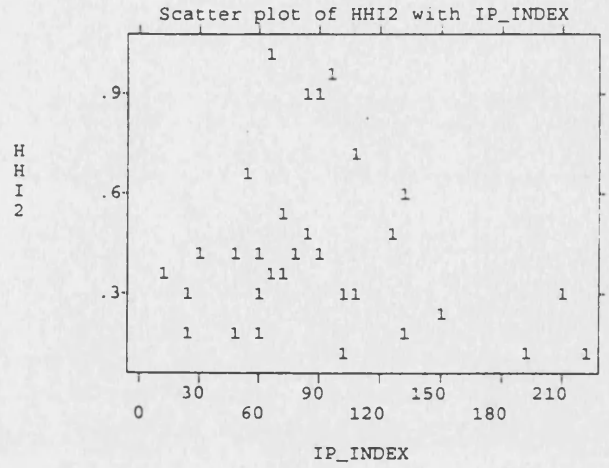
	BMG	PHYATHAI	RKH	MAYO	CHULA	RAMA	RAJAVITHI	WACHIRA
ACCESS	1.45	1.47	2.55	2.59	1.27	1.53	1.77	2.61
COMFORT	0.74	0.40	0.34	0.43	0.06	0.14	0.18	0.12
DR EXPLAI	0.38	0.29	0.34	0.38	0.40	0.46	0.48	0.42
SKILL DR	1.66	1.78	1.23	1.15	1.96	1.67	1.35	1.14
SYMP NURS	0.41	0.35	0.22	0.10	0.07	0.21	0.16	0.00
CHEAP	0.05	0.10	0.09	0.14	0.86	0.67	0.72	0.73
PROMPT	0.56	0.62	0.50	0.70	0.17	0.28	0.32	0.25
CONTACT	0.00	0.11	0.02	0.08	0.46	0.19	0.30	0.46
EQUIPMEN	0.92	0.78	0.61	0.45	0.62	0.80	0.53	0.31
REGIST	0.00	0.08	0.00	0.00	0.05	0.03	0.00	0.00
REGULAR	0.00	0.01	0.07	0.00	0.00	0.02	0.06	0.00

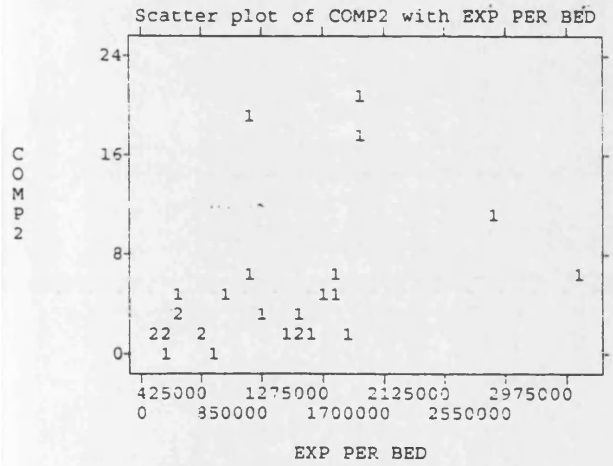
Appendix 15
Frequency of complaints by hospital ownership

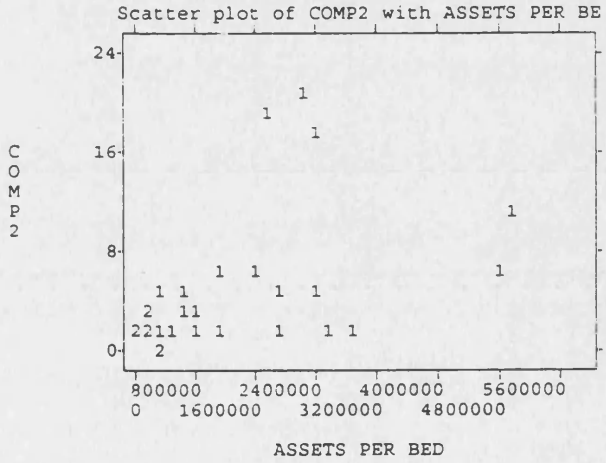
COMPLAINT	No. of complaints about public hospitals	As % of all public hospital complaints	No. of complaints about private hospitals	As % of all private hospital complaints	No. of complaints about all hospitals	As % of all complaints
Slow	79	15.83%	18	9.84%	109	14.44%
Long Queue	58	11.62%	31	16.94%	103	13.64%
Poor service	47	9.42%	18	9.84%	76	10.07%
Rude	58	11.62%	12	6.56%	74	9.80%
Apathy	39	7.82%	13	7.10%	57	7.55%
Impolite	42	8.42%	7	3.83%	55	7.28%
Manner	25	5.01%	9	4.92%	38	5.03%
Careless	24	4.81%	7	3.83%	32	4.24%
Expensive	5	1.00%	21	11.48%	31	4.11%
Reception	21	4.21%	5	2.73%	28	3.71%
Poor advice	19	3.81%	3	1.64%	23	3.05%
Crowded	14	2.81%	5	2.73%	22	2.91%
Cleanliness	15	3.01%	4	2.19%	19	2.52%
Wrong diagnosis	6	1.20%	8	4.37%	15	1.99%
Discriminate	11	2.20%	0	0.00%	13	1.72%
Queue jumping	11	2.20%	1	0.55%	12	1.59%
Poor exam	5	1.00%	6	3.28%	12	1.59%
Long process	11	2.20%	1	0.55%	12	1.59%
Over-charge	1	0.20%	8	4.37%	9	1.19%
Limited	5	1.00%	2	1.09%	8	1.06%
Incompetent	3	0.60%	4	2.19%	7	0.93%
Total no. complaints	499	100.00%	183	100.00%	755	100.00%

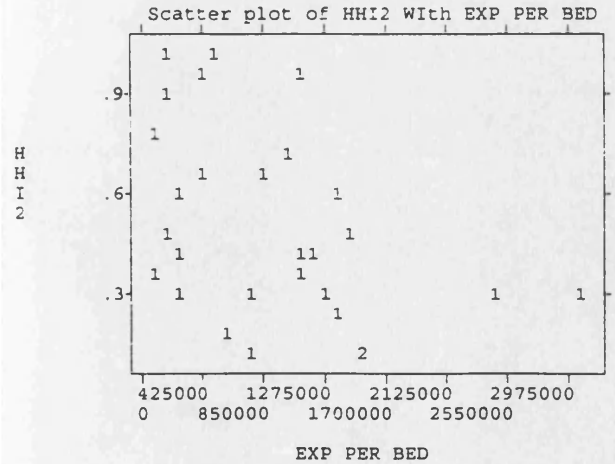
Appendix 16
Scatter plots for correlation analyses in Chapter 8

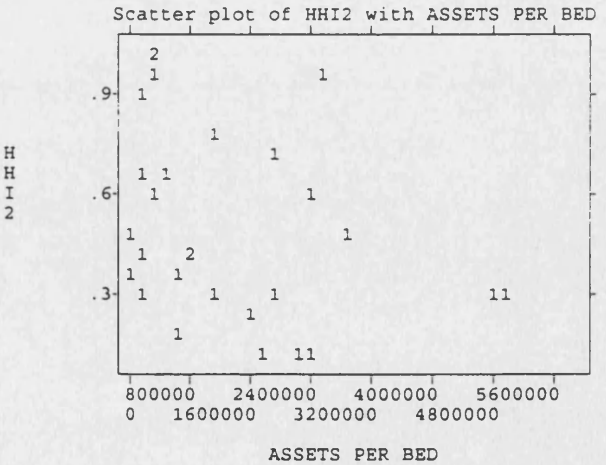




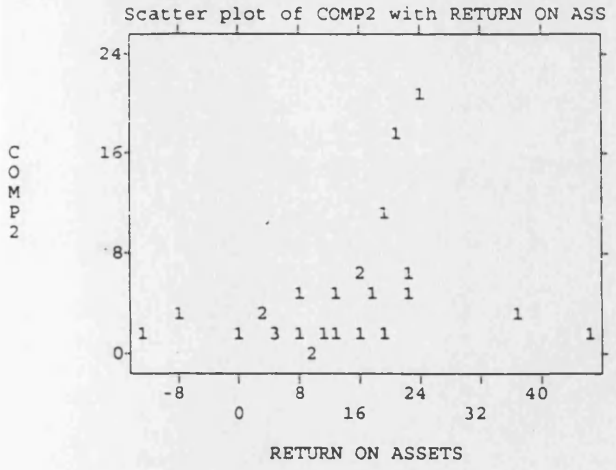


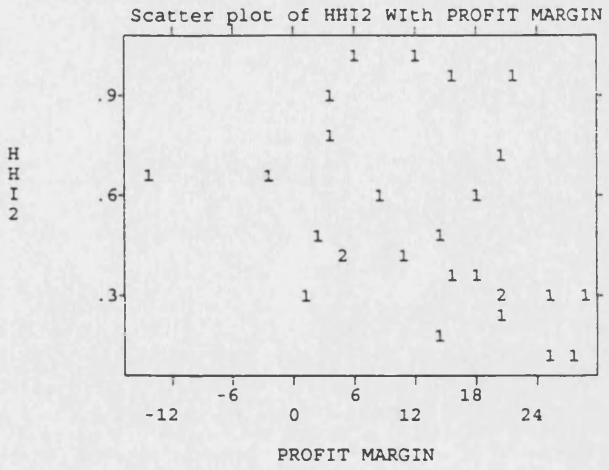


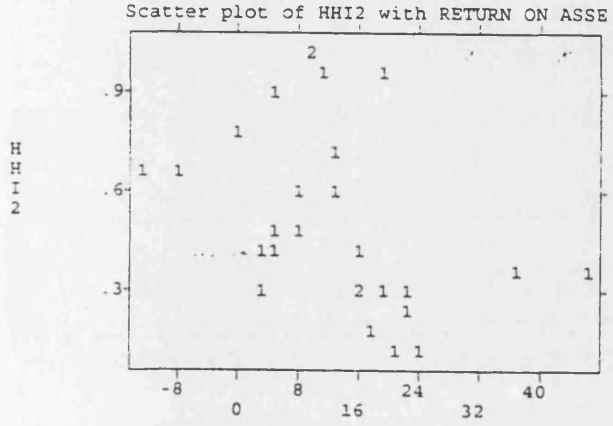


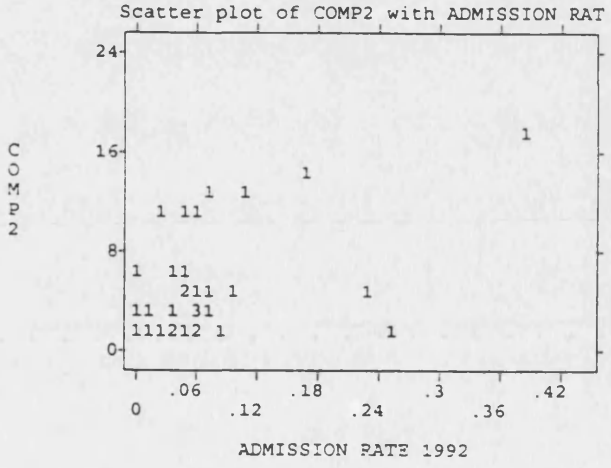


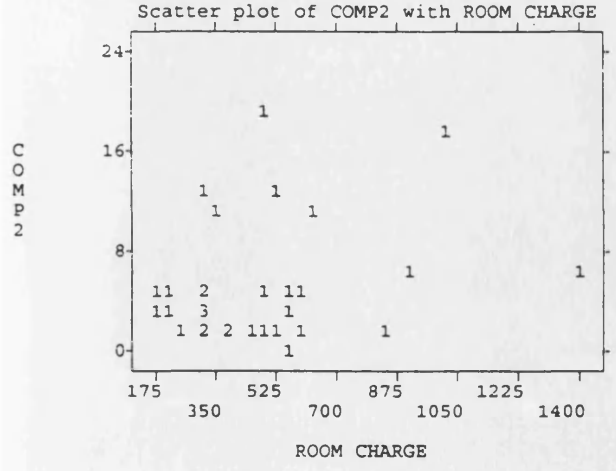
Appendix 16 - continued
Scatter plots for correlation analyses in Chapter 8

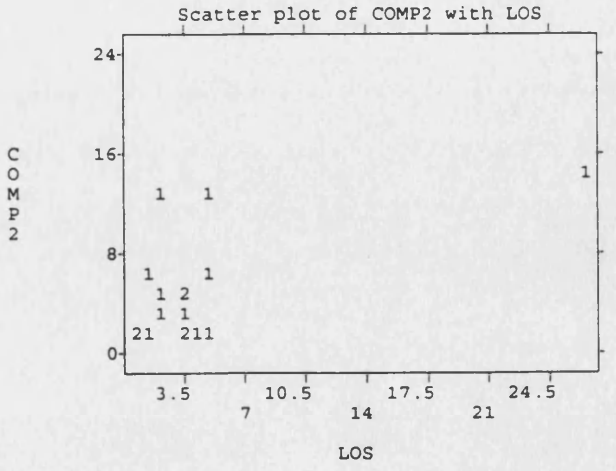












Appendix 17
Competition measures by hospital

NAME	COMP2	COMP5	BEDCOMP2	BEDCOMP5	HHI2	HHI5
PHYATHAI 1	21	57	5.1	2.4	0.100	0.045
PHYATHAI 2	17	45	5.6	2.9	0.107	0.057
DECHA HOSPITAL	19	55	1.6	0.7	0.108	0.045
MISSION HOSPITAL	13	60	5.0	1.2	0.132	0.047
KWONG SUI HOSPITAL	14	52	1.3	0.3	0.147	0.054
CHONGCHIN HOSPITAL	13	57	1.7	0.4	0.180	0.054
RATBURANA HOSPITAL	5	18	28.1	4.9	0.193	0.153
HUACHIEW HOSPITAL	11	62	33.0	4.5	0.199	0.046
BANGKUTIEN HOSPITAL	5	26	24.5	2.1	0.204	0.107
SAHAVEJ POLYCLINIC	11	51	0.6	0.1	0.231	0.054
KRUNTHEP HOSPITAL	6	27	42.7	11.8	0.260	0.113
ST LOUIS HOSPITAL	11	44	11.8	3.9	0.271	0.069
SAMITIVEJ HOSPITAL	6	31	21.8	3.9	0.272	0.110
PROMMIT	6	35	8.7	1.5	0.272	0.102
BAMROONGRAD	11	61	13.4	2.0	0.273	0.046
YAOWARAK HOSPITAL	4	31	12.4	0.7	0.293	0.147
KRUNGDHON HOSPITAL	5	40	36.7	1.7	0.297	0.102
KLONGTON HOSPITAL	5	21	6.2	1.8	0.312	0.112
PETHAVEJ	4	22	12.9	4.1	0.331	0.123
PATANAVEJ HOSPITAL	4	15	7.4	1.5	0.332	0.128
PAATBUNYAR HOSPITAL	2	15	45.5	7.3	0.372	0.131
PASICHALOEN HOSPITAL	2	19	45.5	3.7	0.385	0.089
PATANAPAT	3	22	5.6	0.8	0.389	0.154
SUKHUMVIT HOSPITAL	4	14	37.3	7.4	0.406	0.132
ROMSAI POLYCLINIC	2	19	21.7	0.9	0.414	0.153
KASEMRAD HOSPITAL	3	8	59.5	26.6	0.420	0.175
PHETKASEM-BANGKAE HOSP	3	9	18.3	10.1	0.433	0.171
MAY YO HOSPITAL	2	7	49.8	24.5	0.442	0.230
RAMA SUKSAWAT HOSPITAL	5	18	6.0	3.2	0.467	0.173
V.S. POLYCLINIC	6	17	0.4	0.2	0.475	0.190
BANGBORN HOSPITAL	1	8	50.0	7.3	0.500	0.189
BINTONG POLYCLINIC	1	8	50.0	8.0	0.500	0.217
WIPAWADI HOSPITAL	1	6	46.7	23.6	0.502	0.223
BANGPAI HOSPITAL	2	25	66.7	2.2	0.520	0.214
SUKSAWAT POLYCLINIC	5	28	1.9	0.3	0.616	0.179
THONBURI HOSPITAL	5	30	18.5	5.5	0.619	0.108
BAANMAI POLYCLINIC	4	37	1.9	0.2	0.633	0.086
WICHANYUT HOSPITAL	1	6	23.1	9.3	0.645	0.223
BANGPAKOW POLYCLINIC	5	20	6.3	1.8	0.661	0.133
KLUAY NAMTHAI	3	5	59.5	26.6	0.680	0.099
PAOLO MEMORIAL	3	34	81.5	3.7	0.684	0.080
BANGPOO HOSPITAL	2	20	83.3	1.6	0.708	0.116
SAENAVEJCHAKARN	1	7	11.9	2.8	0.790	0.192
CENTRAL GENERAL HOSPITAI	5	32	93.8	14.2	0.883	0.584
ANANPATANA HOSPITAL	1	12	6.1	0.5	0.885	0.227
YANHII POLYCLINIC	2	26	2.9	0.3	0.888	0.102
KANARPAAT POLYCLINIC	1	4	3.6	1.3	0.930	0.325
SIAM HOSPITAL	1	4	96.4	51.9	0.930	0.424
RAMKAMHAENG HOSPITAL	1	5	96.9	57.7	0.940	0.398
LADKABUNG	0	1	100.0	45.5	1.000	0.504
BANGMOD	0	20	100.0	11.2	1.000	0.170
BANGNA HOSPITAL	0	1	100.0	100.0	1.000	1.000